American Perfumer AND AROMATICS

COSMETICS
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•

FLAVORS
AEROSOLS

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ESSENTIAL OILS

APRIL 1959

THE MAGAZINE OF TASTE AND SCENT

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Natsudaidai . . . Page 30 • Oleoresins . . . Page 37

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American Perfumer AND AROMATICS

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JOHN H. MULLER *Vice President and Business Manager*
M. G. DE NAVARRE *Editorial Director*
WM. E. VANDIVEER *Managing Editor*
WALTER M. BONE *Assistant Editor*
ROBERT E. SANFORD *Circulation Director*
MARY HARRIS *Advertising Production Mgr.*
A. van der SHAW *Art Director*

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the Reader Speaks!

Members of The Society of Cosmetic Chemists recently were queried in regard to the merit of the documentary series currently appearing in these pages.

How grateful I am for the response and for the many fine voluntary comments and suggestions. I can't begin to emphasize the value of the service rendered us by this basic group of readers.

The reader by airing his views, his problems and his needs, can do much to mold and guide editorial content. For example:

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I am sure that the above will serve to demonstrate the active will serve to demonstrate the active part the reader can play in guiding the publisher.

James H. Moore, Jr.
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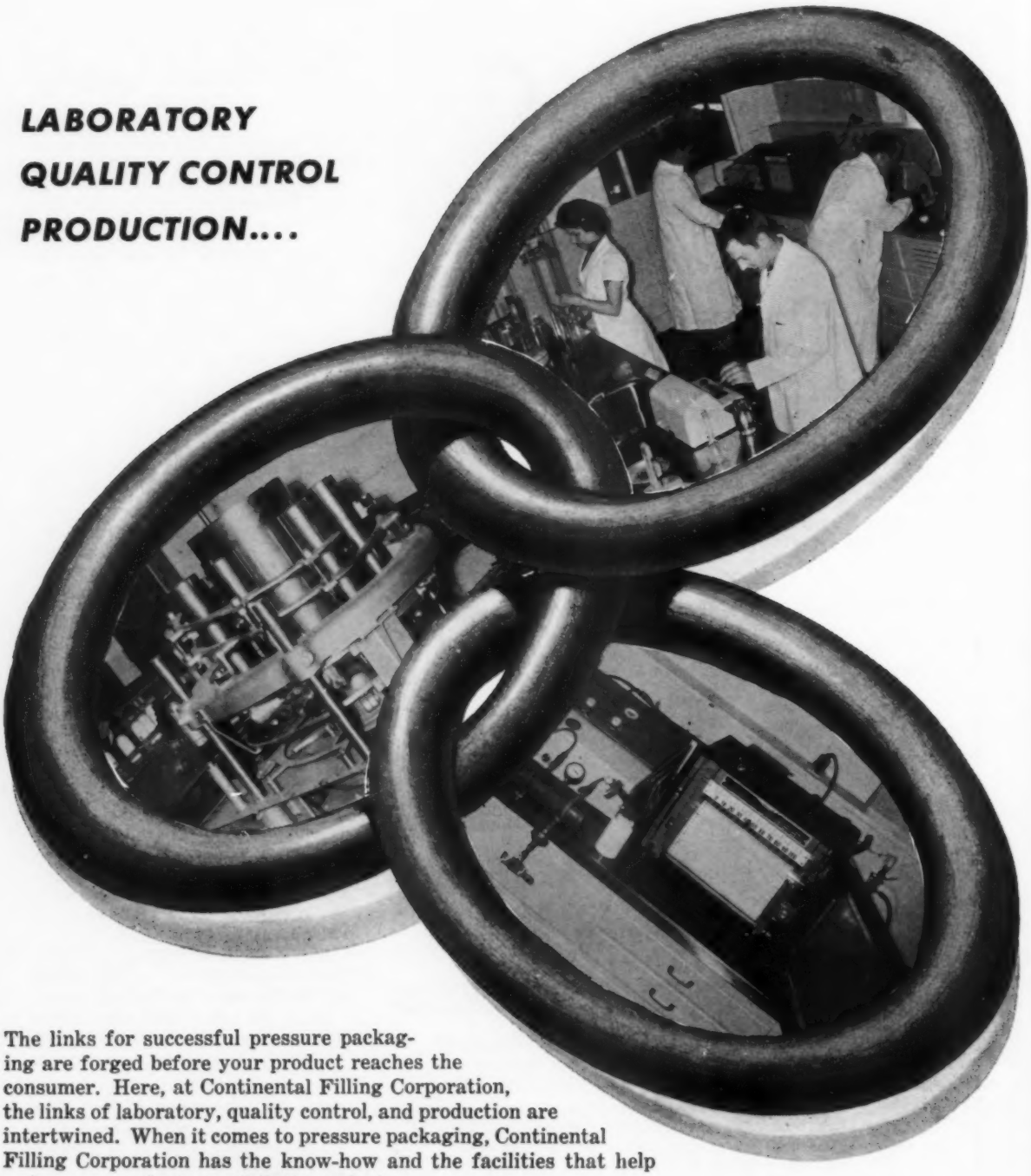

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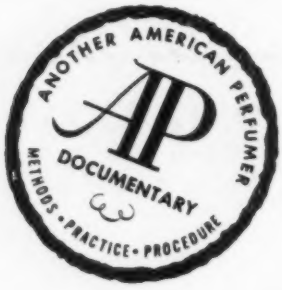

This is the "hall mark" of the series which has been winning increasing acclaim throughout the industry. And, in response to the tremendous demands for the individual documentaries, they have been made available in reprint form.

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New Mown Hay	DH-69
Spice	DH-74
Pine Virgin	DH-112
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Spice Lavender Bouquet	DH-129
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Orange Blossom	DH-59
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LAST MINUTE NEWS . . .

Record Year For Aerosols Forecast

A record year for the production of pressure cans is the forecast of American Can Company, according to company spokesman, Robert Hollister. He predicts "the biggest year ever in the aerosol industry, with the production of 555 million pressure cans. This is a 15 per cent increase over the 483 million units produced in 1958." Hollister said last year's increase over 1957 production of 420 million cans was largely due to the introduction of pressure-packed toothpaste. It was noted that slightly more than 80 per cent of the expected production will go to the market containing non-food items. In this area, hair sprays, room deodorants, shaving lather, insect killers and repellants are the volume leaders, Hollister said.

La Maur Issued Patents On Hair Spray

La Maur Inc., Minneapolis, Minnesota, has been granted a patent on the basic formula now being used by hair spray manufacturers. The patented formula contains polyvinylpyrrolidone. According to a company source, hair sprays have become the second largest selling item in the beauty business.

Half Of All U. S. Families Used Sun Screens In 1958

A recent survey indicates that approximately half of all U. S. families purchased some brand of suntan preparation during the 1958 summer season. According to the results of a national "Consumer Survey on Suntan Preparations" conducted by the Home Makers Guild of America for the Toiletry and Cosmetics Division of Owens-Illinois Glass Co. More than 8 out of 10 families purchasing suntan preparation in 1958 did so primarily for the protection against sunburn. However, more than a third used it to provide a suntan. More than one-half the families surveyed reported that they preferred a four-ounce container.

Rexall Drug Plans Name Change

Plans to change the name of the Rexall Drug Co. to Rexall Drug and Chemical Co. were announced recently by Justin Dart, Rexall president, in the company's annual report. The plan is a result of expanded operations by the company's Chemo-Plastics Division. The report indicated a substantial increase in both sales and profits for 1958.

Perfume and Movie Tie-In Announced

Parfums WEIL have announced that they will participate in a major tie-in with Metro-Goldwyn-Mayer, Seventeen Magazine, and four leading fashion manufacturers. The promotion, to be launched by a six-page, four-color advertising portfolio in the April Issue of Seventeen, will highlight M-G-M-'s new movie, "Green Mansions."

Fellowship Awarded Dr. Hasegawa

Dr. Junji Hasegawa of Chicago has been named to receive the 1959 Gillette-Toni Fellowship for dermatology study at the Northwestern University Medical School, it was announced this month by Raymond E. Reed, vice president in charge of technical operations for the Toni Company.

New Magazine For Teenage Girls

The necessity of deodorants and the nuances of fragrances are pointed up to teen-age girls in a major editorial spread in the first issue of Ingenue (on the newsstands April 16th), the new service and guidance magazine for girls between 13 and 19.

Checchi Addresses Society of Flavor Chemists

The Assistant to the Deputy Commissioner of the Food & Drug Administration, Arthur Checchi, addressed a meeting of the Society of Flavor Chemists in New York, on April 2nd. Mr. Checchi outlined those provisions of the food additive amendment which directly effect flavor technology. The speaker entertained questions from the floor, most of which were of the "how soon" type asked with emphasis upon the flavor chemist's need for time to conduct toxicity tests in accordance with the new law. Mr. Checchi stressed the FDA's appreciation of the contributions made by industry members toward the development of the new law, and pointed out the availability of the FDA personnel for advice and technical information as to the new law and its relation to food additives.

SCC Semi-Annual Technical Meeting Papers Announced

The semi-annual technical meeting of the Society of Cosmetic Chemists will be held at the Hotel Commodore, New York City, on May 7. Presentation of papers will be in the following order: "Measurement of Skin Moisture by Potentiometric Methods," Dr. I. S. Botwinick Research Testing Laboratories, New York City; "Degerming Activity of Toilet Bars—Interpretation of Bacteriological Data from Hand Washing Tests," Dr. J. J. Travers, Levers Brothers; "Long Term Tissue Culture as an Instrument in Quantitative Research," Dr. Wilton R. Earle, Laboratory of Biology, National Cancer Institute; "The Effect of Sorbic Acid and other Preservatives on Organism Growth in Typical Non-Ionic Emulsified Cosmetic Products," Mr. R. Donald Charles, Atlas Powder Co.; "Application of Gas Chromatography and Mass Spectrometry to the Determination of Odor," Dr. Charles Merritt, Jr., Quartermaster Research and Enginering Center; "Mechanisms of Enzyme Action," Dr. Daniel E. Koshland, Jr. Brookhaven National Laboratory, "Corrosion Testing of Aerosol Products," Mr. Morris J. Root, George Barr & Co.

Detergent Being Market Tested

The Formfit Company, manufacturers of undergarments, is currently market testing a detergent for hand washing foundationwear. It is packaged in a plastic bottle which is topped by Precision Valve Corporation's new stream metering valve.

Color Law Passed

Passed on March 13, 213 to 94, bill in the House of Representatives to permit until Sept. 1, 1961, the artificial coloring of the skins of mature oranges with the citrus Red No. 2.

Dr. Griffith Re-elected

Dr. Ivor Griffith was re-elected president of the Philadelphia College of Pharmacy and Science for the nineteenth consecutive year.

Jean Baer Lectures

For the second consecutive year, Jean W. Baer, Pennsalt Chemicals representative for Isotron aerosol propellents in the Northeast area, addressed senior and graduate students at the Massachusetts College of Pharmacy in Boston this month. His subject, "Aerosols and Pharmaceutical Spray Products," outlined the recent developments in the packaging and marketing of pharmaceuticals in pressurized containers and told the future pharmacists about the predicted future in this field.

Hooker Forms Overseas Company

Hooker Chemical Corp., has formed a Bahamian corporation, Hooker Chemical Internation Limted, for the purpose of engaging in chemical manufacturing and marketing activities in Latin American countries. At the same time it was announced that a Mexican company was formed, primarily for the purpose of manufacturing and marketing phosphates in Mexico.

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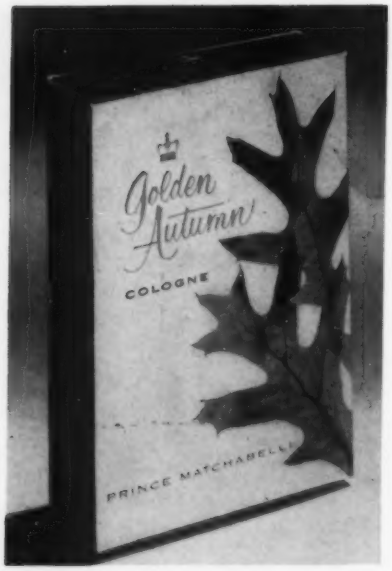
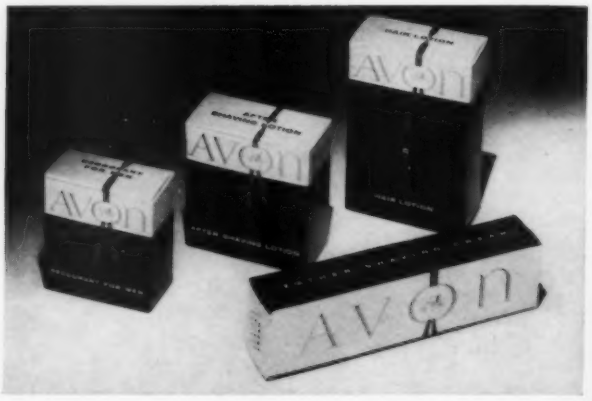
1959 Folding Paper Box Competition

Ten cosmetic packages received awards in the 1959 carton competition sponsored by the Folding Paper Box Assn. of America. They are among 100 award winners selected by a jury of 21 printing and packaging experts from 1,214 entries.



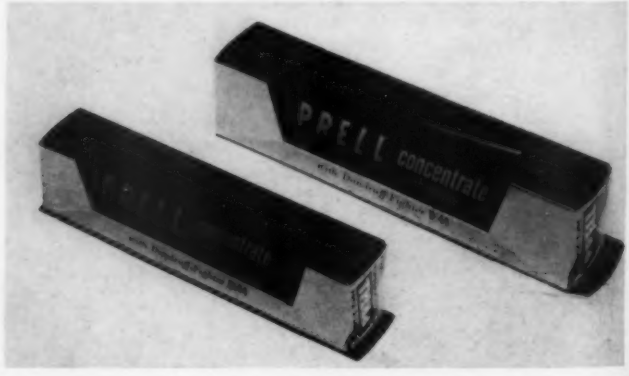
▲ Dominated by a colorful spray of fall leaves in red, yellow, black and gold, this Prince Matchabelli Golden Autumn Cologne carton was given first award in the color process letterpress printing classification of the Folding Paper Box Assn. of America's Annual Folding Carton Competition. It was produced by the Warner Brothers Co., Bridgeport, Conn., for Prince Matchabelli, Inc., New York, N. Y.



▲ These boxes, used by Avon Products, Inc., New York, N. Y., for its masculine toilet items, won two first awards in the Folding Paper Box Assn. competition. The judges gave the entry top rating in the multi-color letterpress printing category and for merchandising superiority in the cosmetics and personal products group. Designed by Avon's Maxwell B. Rogers, the cartons were cited for the ingenuity displayed in establishing the family identity of a new line of products.

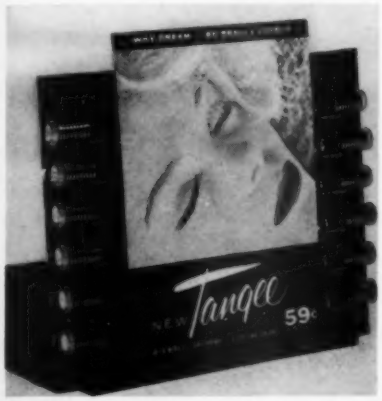
▲ Using pink plus a subtle gold bronze, these "Touch and Glow" make-up cartons won the first award in the two-color letterpress printing classification of the Folding Paper Box Assn. of America's Annual Folding Carton Competition, because of their excellent adaptation of graphic elements. Produced by the Lord Baltimore Press, Inc., Baltimore, Md., for Revlon, Inc., New York, N. Y., the boxes were cited by the judges for precise color register and cleanliness of printing.

▼ After many attempts at variation, the Procter and Gamble Co. and The Richardson Taylor-Globe Corp., both of Cincinnati, O., have developed an effective package innovation for Prell. In selecting this box for a merit award in the merchandising superiority classification of the annual carton competition, judges noted particularly the showcase effect achieved without use of a film window. The plastic tube of Prell is clearly visible and foil inside illuminates the tube from the rear adding luster to an already outstanding carton.



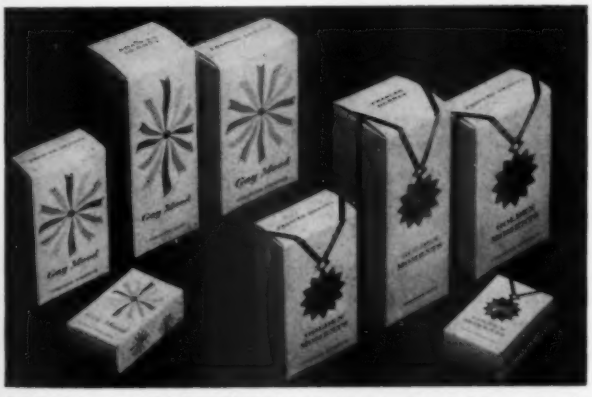
▲ Spring Fancy, a line of colognes by Prince Matchabelli, Inc., New York, N. Y., caught the fancy of all the judges in the 1959 Folding Carton Competition because of its delightful surface design and won a merit award for general merchandising superiority. The elegant simplicity of the cartons, the delicate lace borders and colorful approach of the graphic presentation is like a real breath of spring. The cartons, created by The Warner Brothers Co., Bridgeport, Conn., are printed in four colors by letterpress on .018 Warren's Lusterboard.

▲ Cited for the cleanliness of its printing and general simplicity, the boxes used for the Avon "Here's My Heart" family of cosmetics won a merit award in the one-color letterpress classification. They were produced by the Lord Baltimore Press, Inc., Baltimore, Maryland, for Avon Products, Inc., New York, N. Y.



▲ Winner of a merit award in the color process letterpress category was this eye-catching Tangee display. Shuttleworth Carton Company, New York, N. Y., produced this item for George W. Luft Co., Long Island City, N. Y. It received high praise from the judges for the manner in which the printer solved numerous technical problems and turned out a superior printing job.

▲ Designer Max Rogers of Avon Products, Inc., New York, N. Y., joined forces with the creative staff of F. N. Burt Co., Buffalo, N. Y., to produce this unique package for Avon's Wishing line of cosmetics. It won a merit award in the lithography classification. The reverse side of the board is in gold while the front makes effective use of pastels. The three enclosed boxes are gold inlaid, stamped with coin designs in keeping with the fountain illustrated on the front of the outside carton.



▲ Superiority of printing adapted to the finest of materials, captured a merit award for these package families in the lithography classification. The boxes were produced by F. N. Burt Co., Buffalo, N. Y., for Denney and Denney, Inc., Philadelphia, Pa. The rich result achieved through the use of Lowe's 90-pound board and gold leaf stamping maintained the traditional quality appearance of the packages at substantially lower cost than was formerly possible with set-up boxes.

These sophisticated cartons containing Chantal colognes won a merit award in the multi-color letterpress printing category. Produced for Cosmair, Inc., Clark, N. J., by Shuttleworth Carton Co., New York, N. Y., they won the praise of the judges for the crisp and effective manner in which artist and printer combined their skills to turn out an unusual package in gray, black and gold with a Kromekote board. ▼

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When you drop a packaging problem in our lap, the end result is more than a glass container. It is an idea . . . born of restless imagination, shaped by skilled hands, backed by years of sound experience. Our creative staff gives you a selling package that packs well, helps stop the eye and start the sale at the point of purchase. For a successful solution to your design problem, contact MARYLAND GLASS CORP., 2153 Wicomico St., Baltimore 30, Md.

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pharmaceutical cosmetics

"PHARMACEUTICAL COSMETICS," the fourth in our series of documentaries on current method and procedure, is scheduled for our May issue, to coincide with the industry's swing toward the development of pharmaceutical formulations.

Some of the areas that will be covered by "PHARMACEUTICAL COSMETICS" can be seen from this partial listing of subject-matter and authors:

—*New Answers to Hormone Cream Questions, by Dr. Max A. Goldzieher*
—*Anticholinergic Drugs as Antiperspirants in Cosmetics, by Dr. Robert Brun*
—*Glycyrrhetinic Acid in Dermatology, by F. Quention Evans*
—*Sulfur in Cosmetics and Dermato-Therapeutics, by Dr. T. A. Neesby*
—*Neomycin in Deodorant Preparations, by H. A. Nelson, The Upjohn Co.*
—*The Treatment of Acne With Cosmetics, by Dr. Irwin I. Lubowe*

Others include "The Use of Antiseptics and Germicides in Soaps and Other Preparations" . . . "Vitamins and the Skin" . . . "Topical Steroids in Ageing and Senile Skin Cosmetics."

Consider the timeliness of "PHARMACEUTICAL COSMETICS," consider, too, the popularity of our documentary series . . . and you will immediately see how a pre-conditioned audience is assured for pharmaceutical-slanted advertising copy in the May issue.

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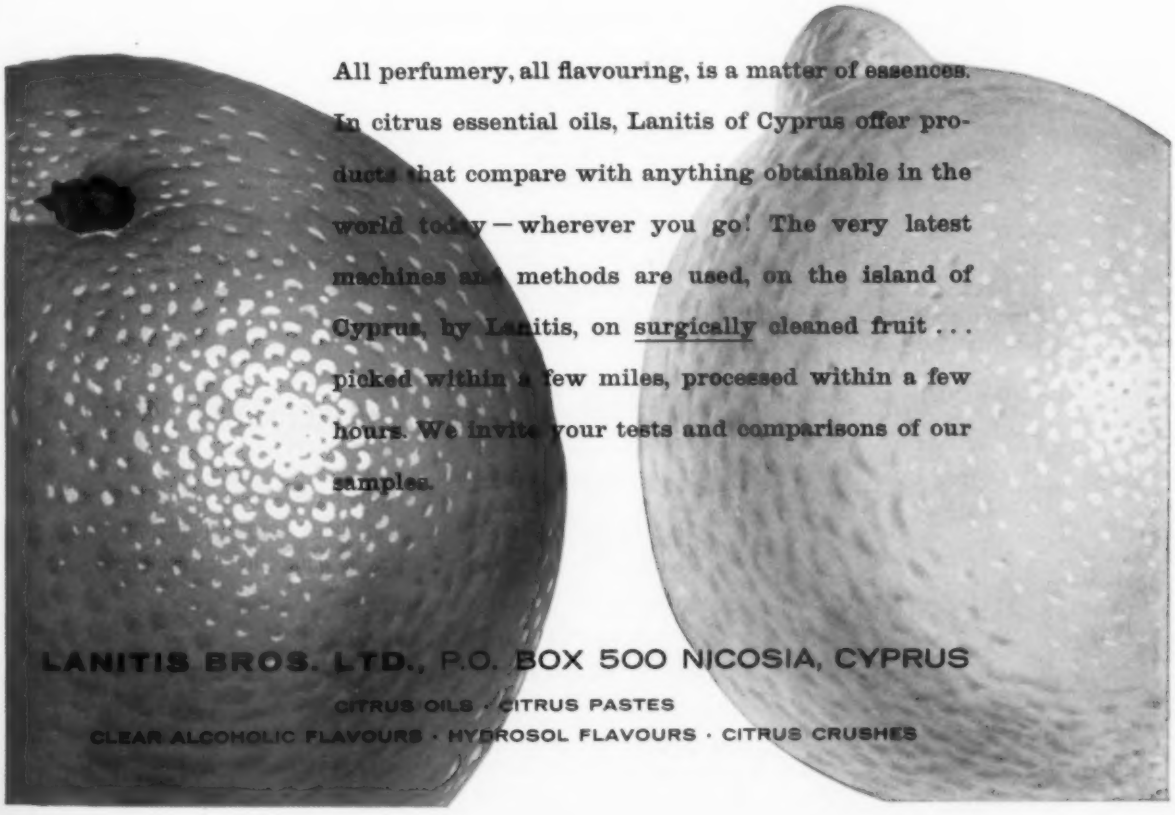

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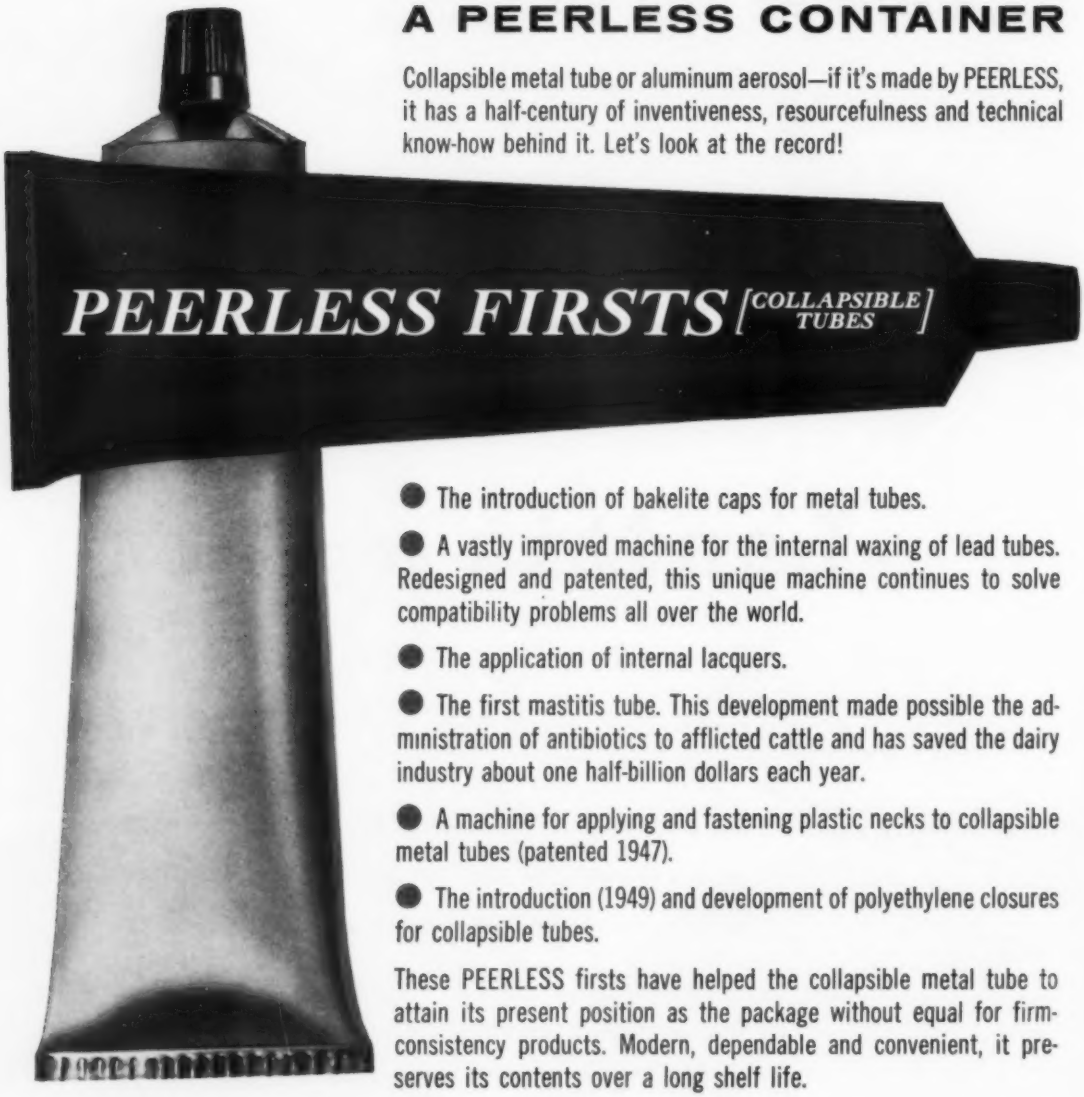
Collapsible metal tube or aluminum aerosol—if it's made by PEERLESS, it has a half-century of inventiveness, resourcefulness and technical know-how behind it. Let's look at the record!



- The introduction of bakelite caps for metal tubes.
- A vastly improved machine for the internal waxing of lead tubes. Redesigned and patented, this unique machine continues to solve compatibility problems all over the world.
- The application of internal lacquers.
- The first mastitis tube. This development made possible the administration of antibiotics to afflicted cattle and has saved the dairy industry about one half-billion dollars each year.
- A machine for applying and fastening plastic necks to collapsible metal tubes (patented 1947).
- The introduction (1949) and development of polyethylene closures for collapsible tubes.

These PEERLESS firsts have helped the collapsible metal tube to attain its present position as the package without equal for firm-consistency products. Modern, dependable and convenient, it preserves its contents over a long shelf life.

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Aluminum Aerosols by *PEERLESS* have these important advantages

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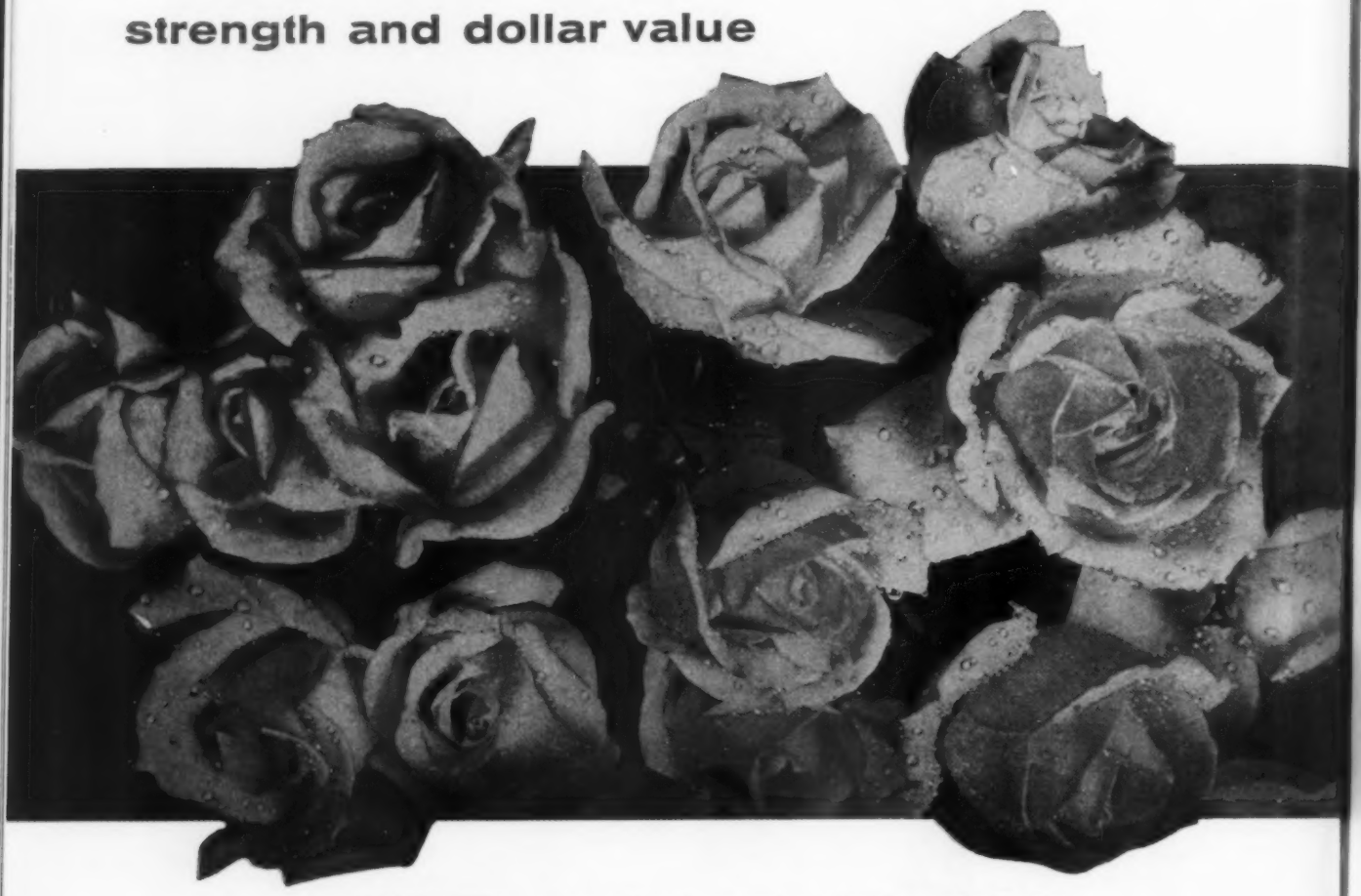
FOR YOU 1. Preciseness of valve-cup fit greatly improved by patented* process. 2. Container is sturdy and seamless to withstand all required pressures. 3. Tested by more than three years of manufacture and use. 4. Available in a choice of diameters and lengths for each size—½-ounce to 4-ounce.

NO FINER METAL CONTAINERS MADE ANYWHERE **PEERLESS** *TUBE COMPANY*

BLOOMFIELD, NEW JERSEY

*U. S. PATENT NO. 2,856,102 — OCTOBER 14, 1958

ROSYNTHIA . . . unsurpassed in lasting floweriness, strength and dollar value



ROSYNTHIA . . . a new Givaudan creation, offers tremendous value to the creative perfumer.

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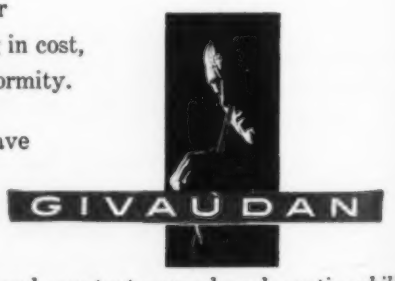
This new development is the latest of many which have established Givaudan as a leader in the field.



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LECITHIN

Commercial lecithin (really a phosphatide) is a mixture of cephalin, lecithin and related compounds. It is generally derived from soybean or corn oil, therefore, the mother oil affects the fatty acid components of the "lecithin."

Though used more widely in foods, it has a place in cosmetic practice. It is a most interesting emulsifier. A refined grade shows little discoloration or hydrolysis of choline in emulsified cosmetics. It is a useful interface modifier in make-up items. In shampoo it is a superb "conditioner" and emollient.

ROYAL JELLY

Johansson's latest summary of articles published subsequent to his previous review, apeared at year end. With his typical care he tabulates animal and human results, number of humans or animals used in the test as well as the results claimed.

It is not stretching the facts to observe (a) how few human cases were treated, (b) lack of objectivity in the tests and (c) reporting over enthusiastically on the findings. Indeed, if one were to take at face value some of data, there might be a question of the safety of royal jelly to humans.

The most that can be said for it is that it surely works on the bees. Human tests, properly made, are still a crying need.

CHILLING COLOGNES

A recent letter pointed up the need for a bit of horse sense. The letter writer carefully chilled his his cologne for eight to twelve hours, transferred it out of the chilling tanks, then was unable to complete filtration that day. The cologne stood until the next day at room temperature, after which it was filtered. This product showed both cloud and sediment during cool weather.

Wonder why? Wonder how many others have done the same thing?

STAINLESS STEEL EQUIPMENT

The cologne episode reminded me of the number of times one sees expensive stainless steel tanks fitted with brass or bronze outlets. Why?

BRITISH CONGRESS

This writer expects to be attending the British Congress of Cosmetic Science sponsored by the Society of Cosmetic Chemists of Great Britain in London April 15, 16, and 17. The program has been well organized by "Bobbie" Marriott. I'll report on my jet ride back as well as on the Congress itself in the next issue.

TESTS BY CONSUMER'S GROUPS

This subject comes to mind after reading part of the editorial in the MANUFACTURING CHEMIST for February, 1959. It appears that two groups operate in England, much as they do here. But in England as here, price seems to be the major comparison.

This department finds no fault with consumer testing groups but often questions their methods. Price per ounce of product is not a fair method of testing anymore than it is correct to say "equal parts horse and rabbit, one each."

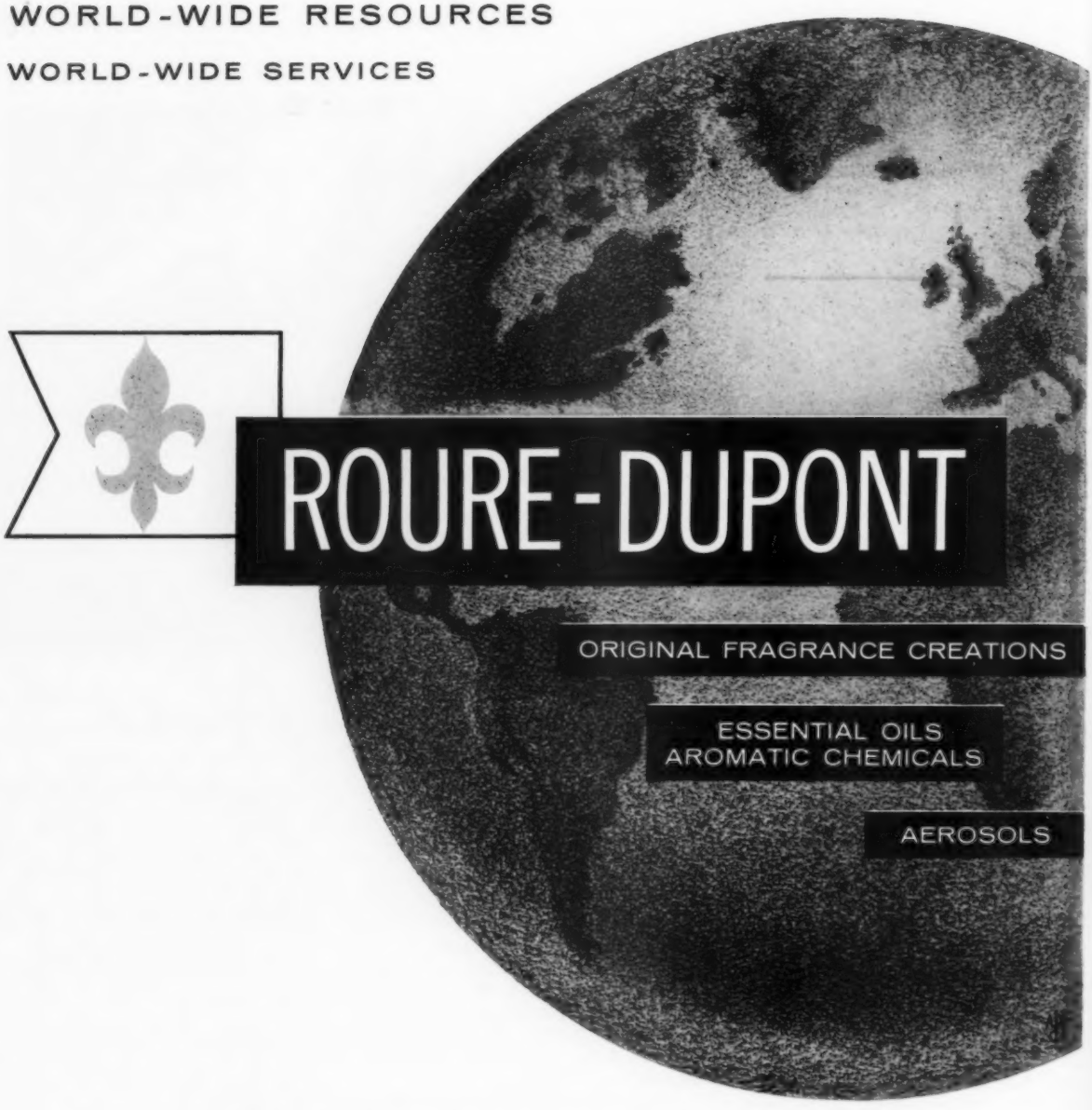
Too often the published results of product comparison fails to mention how the test was made and what controls were used. Furthermore, shades, odors and textures make all the difference between sales and no sales. Yet, these criteria are often bunched like cattle and not analyzed in the aesthetic manner—a sense intended to be influenced by such intangibles. Cosmetic scientists cannot come up with tests to suit them—how can these outside testing groups do it?

NOTES

It is said that the concurrent use of a silicone with a sunscreen potentiates its filtering properties. . . . More data accumulating on

WORLD-WIDE RESOURCES

WORLD-WIDE SERVICES



Roure-Bertrand Fils, Grasse, and Justin Dupont, Argenteuil, France, as well as their facilities in North Africa, India, the Far East and South America, have for decades been prime processors of basic ingredients for the perfumers of the world.

Their creative genius is attested by the many proven international successes in the field of fragrance requirements . . . be it in the development of original perfumes, colognes, aerosols, cosmetics, soaps and other toiletries . . . or in the masking area where odors have to be covered rather than developed.

Roure-Dupont, Inc. technical staff is in a unique position to put its vast international facilities and know-how at your disposal.

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the sensitizing properties of sorbic acid. Before adopting it, better test it out on animals and humans to be sure. . . . Watch for more activity in the field of glycerol ethers of higher alcohols. Their properties have been known a long time but their high price has held up usage. . . . Dr. I. Blank will receive the S. C. C. $1000 Award in May for his contributions to the science of cosmetics. Congratulations to him and the committee who selected him. May your awards continue, Dr. Blank. . . . Though some of our own scientists have become worried about Sr^{90} fallout, our Canadian neighbors have pulled no punches. A McGill University department head over CBS radio said among other things that if no further A-Bombs were exploded, we would produce only 2,500 or so morons as of now, not to mention the harm that can result to forthcoming progeny due to genetic alterations. . . . The JOURNAL OF CHEMICAL EDUCATION has published an interesting reprint of a number of their best articles in a paper bound volume called, "Selected Readings in General Chemistry," priced at $2.00 for 128 pages. . . . Chakravarty and Lach have just published a study on the intersection between high molecular weight polyethylene glycols (Polyox series) and some pharmaceuticals in conjunction with possible complex formation. . . . The same publication (DRUG STANDARDS, Jan.-Feb., 1959) points up the value of using electrolytes in suspensions of zinc oxide in Veegum and CMC.

Trade Literature

The sixteen-page LaPine Apparatus Review 9 introduces many new items of laboratory equipment including, Pumpett automatic pipette control, dial weighing torsion balances, gelation timer, 25-microscope slide box of polystyrene, set-up support, angle-type framework foot, moisture determination balance, cylindrical oven, vacuum pump, tensiometer, Hemato-Kit, and "Pyrex" brand giant reaction flasks.

Flash-Evaporators, including a recently developed line of portable models, are treated in a 4-page section.

Emery Industries offers a new edition of its catalog, listing product designations, descriptions, and specifications for Emery's line of Organic Chemicals. Included for the first time are the Metholene

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QUESTIONS & ANSWERS

1322: VITAMIN E OINTMENT

Q. *Do you have a formulation for analgesic vitamin E ointment? E. B. U., Wis.*

A. The formulation of drug preparations is a little out of our line, particularly when vitamins are involved because of the possible interaction between the analgesic ingredients and the vitamins themselves.

1333: LIPSTICK FORMULATION

Q. *We have noted many interesting and informative cosmetic notes in your Questions and Answers feature. As we are interested in the manufacture of lipsticks, would you supply us with a basic formula as well as suggest some companies to contact for raw materials especially dye houses that deal in the pigments employed in this item?*

A. Your best bet on lipstick formulation is to go to the public library and read deNavarre's book, The Chemistry and Manufacture of Cosmetics which discusses the matter of lipstick from the fundamentals on up. There is also a book edited by Sagarin and others that was published in 1957 which has very good information on this subject. The name of the book is Cosmetics: Science and Technology. The price is $25 and can be obtained from the book department of the American Perfumer and Aromatics. Enclosed is a simple formula as a starting point for lipsticks. The pigment suppliers to contact are the Ansbacher-Siegle Corp., Rosebank, Staten Island, N. Y., and the H. Kohnstamm Co., 83-93 Park Place, New York, N. Y.

Lipstick

	%
Carnauba Wax	7
Beeswax	16
Isopropyl Palmitate	15
White Ceresin	25
Petrolatum	20
Mineral Oil	4
Bromo Acid	3
Color Lakes	10

1334: SOAP GERMICIDE

Q. *We would appreciate receiving any additional information available on the recently introduced soap germicide, N-trichloromethylthiotetrahydrophthaimide. C. R. F., Ill.*

A. We suggest you contact Fleetwood Products Co., 509 Fifth Avenue, New York 17, N. Y. for further information.

From time to time suggestions have been and will be made in this magazine with respect to processes, devices, materials, appliances, equipment and the like. It is not practicable for the writers and editors to have a patent search or examination made in connection with each such suggestion. Our readers are, therefore, requested and indeed urged to determine for themselves whether any patent or other right will be violated before acting on any such suggestion.

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An intense dry Lily-Vetivert Acetate base with rare and verdant tenacity.

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BIOCHEMICAL STUDIES OF NATSUDAIDAI

(*Citrus aurantium L., subsp. natsudaidai* Hayata)

SATOHIKO HATTORI

For many years Japan used Natsudaidai (*Citrus aurantium* L., subsp. *natsudaidai* Hayata) for the preparation of expressed orange oil from the peel and recovery of citric acid from the segment, also it is a most popular summer fruit for eating. After World War II, the demand for fruit juices increased in Japan and considerable amount of this fruit have been utilized for making citrus fruit juice and beverages with the "Unshiu-Mikan" (*Citrus unshiu* Marcovitch) which is the more popular citrus fruit in this country.

It is very important to study the seasonal changes of the components of the fruit from the view point of biochemistry, especially since it requires to be seriously studied for the manufacturing of fruit juice. There are many biochemical investigations on the seasonal changes on the composition of the grapefruit, lemon and orange. (1) (2) (3) However, for the Natsudaidai, not so many reports have been known; Komatsu (4) (5) studied this question more than ten years ago and recently a report has been made by Nomura. (6) (7) (8) Natsudaidai are planted from olden time in Wakayama and Mie prefecture in southern parts of Honshu, Japan and Ehime prefecture in Shikoku-island, and this investigation is undertaken at the Laboratory of the Nankai Fruit Industry Co., Ltd. at Hidaka district which is the center of the citrus plantation in Wakayama prefecture.

The experiment proceeded during the growing season of the fruit from November to June of the next year and for the sampling three Natsudaidai trees (A,B,C) were selected. About ten years have passed after grafting tree A and it bears about one hundred large fruits. About twenty years have passed after grafting tree B and it bears about three hundred fruits and they are comparatively small sized. About thirty years after grafting tree C bears about three hundred fruits, the size of which are as large as those of tree A. The heights of the trees are about five, ten and twelve feet for A, B, C, respectively and they grow on the same field of alluvial soil along the Hidaka River. Six fruits were picked from each tree on a fine day in every month and used for the experiments.

The chemical determinations were tested, using the mixed juice obtained from the six fruits.

1. Soluble solids were determined with a hand refractometer at 20° C;

2. Total acid was determined by titration of juice with 0.1 N NaOH using phenolphthalein as an indicator, the results being calculated as a citric acid with one mol crystallin water;

Table I

Date	Weight of fruit (g.)			Volume of fruit (c.c.)			Specific gravity of fruit		
	A	B	C	A	B	C	A	B	C
Nov. 19	297	260	316	331	279	354	0.898	0.932	0.894
Dec. 25	354	301	316	372	325	340	0.951	0.926	0.930
Jan. 25	322	282	314	333	286	354	0.953	0.985	0.888
Feb. 28	296	268	314	343	310	352	0.864	0.865	0.892
Mar. 26	350	285	318	420	319	378	0.835	0.893	0.842
Apr. 25	345	329	352	410	398	418	0.843	0.826	0.857
May 27	383	327	435	433	428	502	0.885	0.870	0.868
June 30	465	439	475	538	498	551	0.865	0.885	0.862

Fig. 2

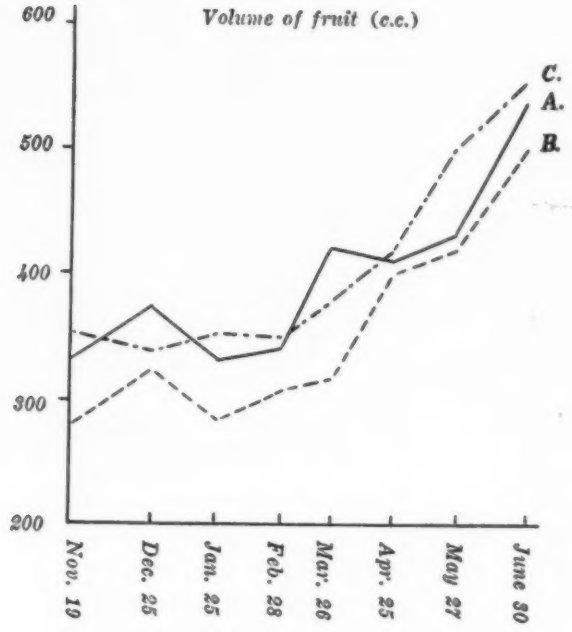
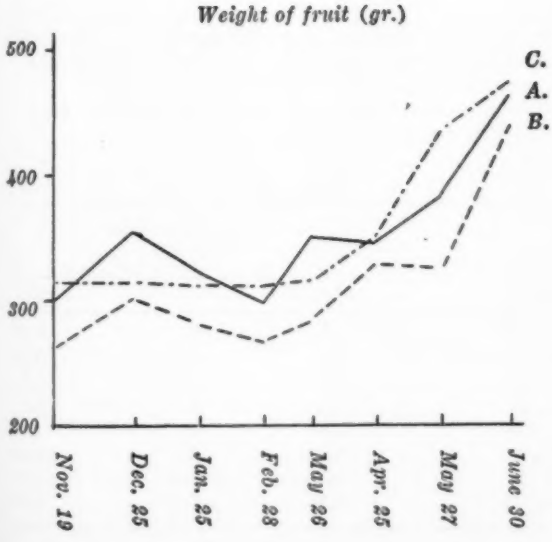


Fig. 1



3. Total and reducing sugar were determined by semi-micro method of Bertrand's; (9)
4. The ascorbic acid was determined by the method described by Fujita. (10) Essentially this method consists of the titration of juice with 2,6-Dichlorophenolindophenol solution which is standardized as a preliminary by fresh commercial crystalline ascorbic acid;
5. The pectin was determined by the calcium salt; (11)
6. pH value was estimated by using "Toyo" pH test-paper;
7. Specific gravity was determined with a Westphal's hydrostatic balance.

The changes in weight, volume and specific gravity are given in Table I and Fig. 1, 2 and 3.

As the above figures show, weight and volume of the fruits showed no remarkable changes until March, then rapidly increased. Specific gravity decreased gradually till March and reached the minimum in March and April.

The changes of the weight percentage of the peel and segment and the weight percentage of the seed to the whole fruit are measured and shown in the Table II and Fig. 4 and 5.

Table II

%

Date		A	B	C		A	B	C
Nov. 19	Peel	31.6	30.4	30.4	Seeds	—	—	—
	Seg.	68.4	69.6	69.6				
Dec. 25	Peel	30.0	28.3	29.4	Seeds	3.2	2.8	3.1
	Seg.	70.0	71.7	70.6				
Jan. 25	Peel	28.0	27.0	28.0	Seeds	2.1	2.2	2.6
	Seg.	72.0	73.0	72.0				
Feb. 28	Peel	34.1	31.3	31.2	Seeds	1.7	1.9	2.0
	Seg.	65.9	68.7	68.8				
Mar. 26	Peel	36.6	35.1	34.3	Seeds	1.6	2.0	1.8
	Seg.	63.4	64.9	65.7				
Apr. 25	Peel	35.7	35.6	35.2	Seeds	1.3	1.7	1.6
	Seg.	64.3	64.4	64.8				
May 27	Peel	38.1	35.6	36.1	Seeds	1.0	1.5	1.4
	Seg.	61.9	64.4	63.9				
June 30	Peel	40.5	40.3	40.6	Seeds	1.0	1.2	1.2
	Seg.	59.5	59.7	59.4				

Fig. 3

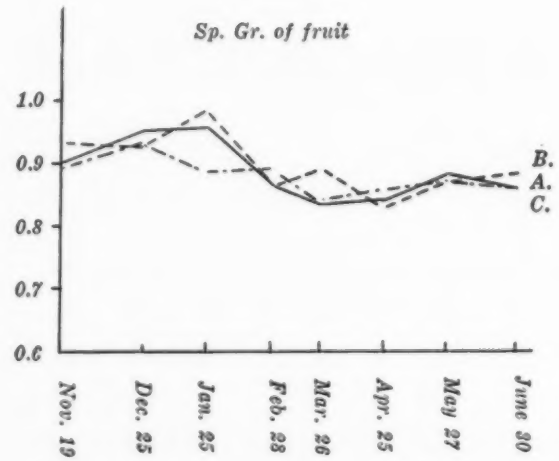


Fig. 4

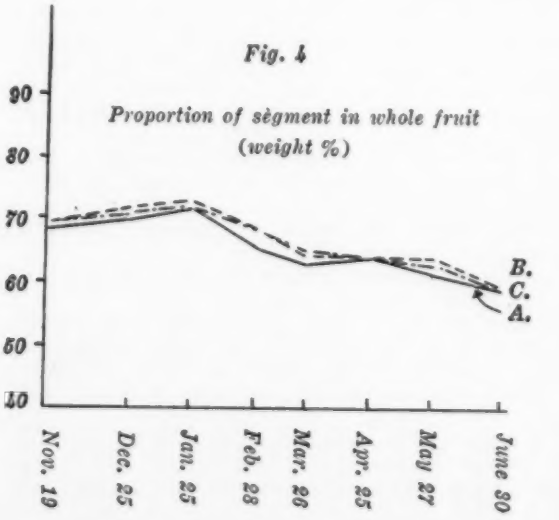
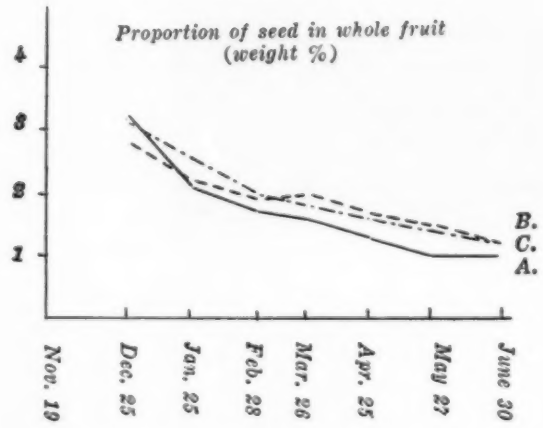


Fig. 5



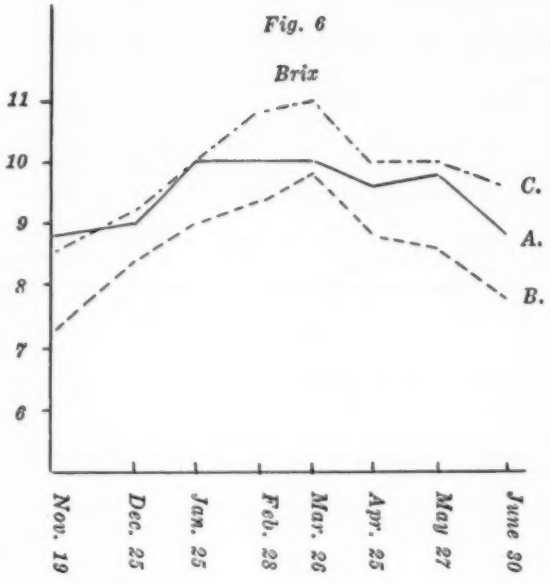
The proportion of the peel to the whole fruit increased gradually as it ripened, and the differences between those of the A, the B and the C were little. The proportion of the seed decreased as the season advanced.

The changes of total soluble solids are given in Table III and Fig. 6.

Table III

Date	Soluble solids (deg. Bx.) A	B	C
Nov. 19	8.8	7.2	8.5
Dec. 25	9.0	8.4	9.2
Jan. 25	10.0	9.0	10.0
Feb. 28	10.0	9.4	10.8
Mar. 26	10.0	9.8	11.0
Apr. 25	9.6	8.8	10.0
May 27	9.8	8.6	10.0
June 30	8.8	7.8	9.6

Fig. 6



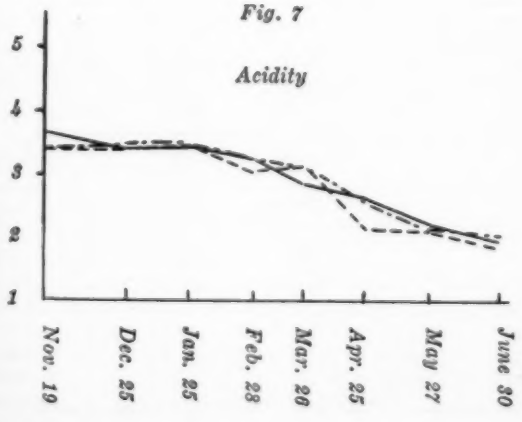
The total soluble solids of juice increased towards March and then decreased. There were distinct differences between individual trees, the proportion of solids in B was lower than those of the A and the C throughout the investigation.

The changes of acidity are given in Table IV and Fig. 7.

Table IV

Date	Acidity (%) A	B	C
Nov. 19	3.68	3.40	3.40
Dec. 25	3.40	3.40	3.48
Jan. 25.	3.46	3.46	3.46
Feb. 28	3.26	3.08	3.26
Mar. 26	2.88	3.17	3.17
Apr. 25	2.65	2.20	2.53
May 27	2.26	2.12	2.16
June 30	1.97	1.87	2.04

Fig. 7



As the fruit ripened, the acidity decreased. In analytical date of Komatsu and Nomura the distinct period of intermediate reducing of the total acidity in midseason of the fruit was found, although by this experiment it was not recognized. The acidity mentioned above represents the concentration of acid in the juice extracted from the fruit. However, the fruit continues to grow and the amount of its juice increases. One can, therefore, suppose that the quantity of citric acid in the fruit may be constant, and that its percentage in the juice seemingly diminishes because of the quantity of juice itself.

Table V

Date	Sugar-acid ratio A	B	C
Nov. 19	2.39	2.12	2.50
Dec. 25	2.64	2.47	2.64
Jan. 25	2.89	2.60	2.89
Feb. 28	3.07	3.05	3.32
Mar. 26	3.47	3.09	3.47
Apr. 25	3.62	4.00	3.96
May 27	4.34	4.05	4.62
June 30	4.47	4.17	4.70

Fig. 8

This apparent constancy of the absolute amount of acid is, however, very difficult to determine, for no means of making all these tests of the identical fruit throughout the season exists, since the specimen is destroyed in testing. This view might be supported to some extent also in this experiment.

The changes of sugar-acid ratio are given in Table V and Fig. 8.

The proportion of total soluble solids to total acidity or the sugar-acid ratio is so-called "maturity." The sugar-acid ratio is, therefore, customarily accepted in the citrus industry as the standard of maturity.(2) Braverman,(3) in his excellent book, states: "California for instance, requires a minimum ratio of 8:1 for orange and 7:1 for grapefruit, whereas the South Africa standards are 5:1 for seedling oranges, 5.5:1 for valencias, and 6:1 for navels; the South African ratio is evidently very low. In Palestine, the ratio of 8:1 is adhered to." On the contrary, the ratio for natsudaidai, the juice of

Table VI

Date	Total sugars (%)			Reducing sugars (%)			Sucrose (%)		
	A	B	C	A	B	C	A	B	C
Nov. 19	4.64	4.51	5.04	2.27	2.25	2.30	2.37	2.26	2.74
Dec. 25	5.09	4.53	5.35	2.91	2.20	2.48	2.18	2.33	2.87
Jan. 26	5.56	4.64	5.50	2.35	2.25	2.47	3.21	2.39	3.03
Feb. 28	5.41	5.00	6.25	2.91	2.14	2.83	2.50	2.86	3.42
Mar. 26	5.89	5.54	6.01	2.93	2.93	3.17	2.96	2.61	2.84
Apr. 25	6.49	6.04	6.79	3.24	2.96	3.30	3.25	3.08	3.69
May 27	6.34	5.30	6.45	3.39	2.63	3.44	2.95	2.67	3.01
June 30	6.10	4.90	6.81	3.72	2.77	3.82	2.38	2.13	2.99

Table VII

(%)	Nov. 19	Dec. 25	Jan. 25	Feb. 28	Mar. 26	Apr. 25	May 27	June 30
A	49	57	42	54	50	50	54	61
B	50	49	49	43	53	49	50	57
C	46	46	45	45	53	47	53	56

Table VIII

	(mg. per 100 ml. juice)					
	A		B		C	
Date	Red.	Total	Red.	Total	Red.	Total
Dec. 25	34.6	—	28.6	—	31.3	—
Jan. 25	30.8	—	29.4	—	30.1	—
Feb. 28	34.8	41.7	32.0	47.7	32.1	49.3
Mar. 26	34.1	37.0	32.6	34.0	34.5	37.0
Apr. 25	34.6	41.3	34.6	41.8	31.1	40.8
May 27	31.4	36.4	27.8	33.4	28.6	31.5
June 30	30.3	35.3	26.4	27.9	28.4	32.6

Table IX

		Nov. 19	Dec. 25	Jan. 25	Feb. 28	Mar. 26	Apr. 25	May 27	June 30
Pectin (%)	A	—	—	—	0.087	0.067	0.084	0.060	0.026
	B	—	—	—	0.092	0.041	0.080	0.059	0.039
	C	—	—	—	0.113	0.117	0.081	0.066	0.031
Ash (%)	A	—	—	—	—	—	0.26	0.34	0.13
	B	—	—	—	—	—	0.23	0.43	0.11
	C	—	—	—	—	—	0.28	0.33	0.22
pH value	A	—	—	—	—	—	2.8	2.8	2.8
	B	—	—	—	—	—	2.8	3.0	3.0
	C	—	—	—	—	—	2.8	3.0	2.8
S.G.	A	—	1.0385	1.0413	1.0406	1.0361	—	—	—
	B	—	1.0345	1.0394	1.0375	1.0345	—	—	—
	C	—	1.0382	1.0419	1.0425	1.0386	—	—	—

Fig. 9

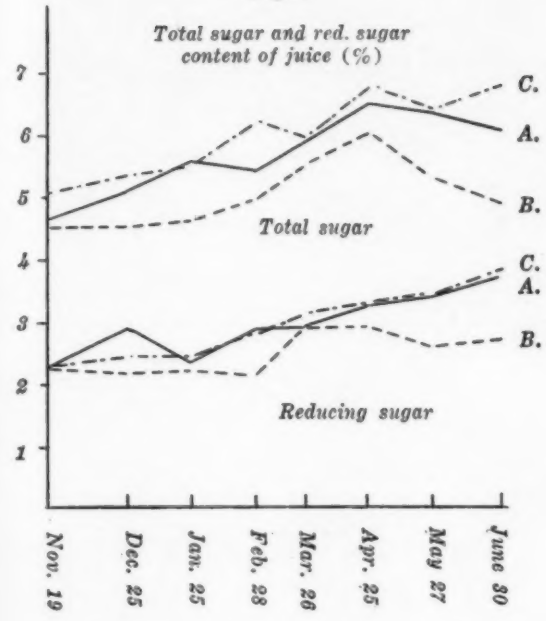
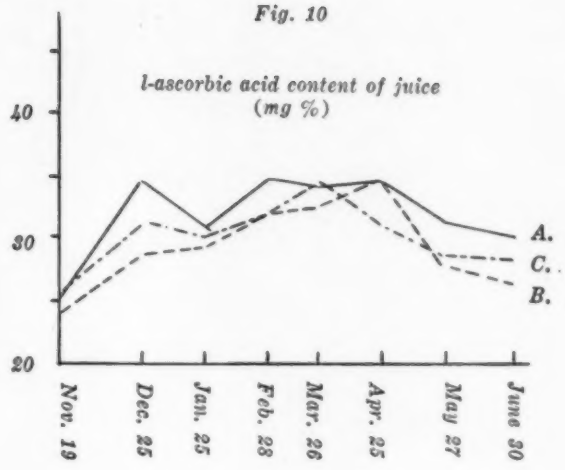


Fig. 10



which contains in solution a large amount of acid but little sugar, is of course considerably lower.

The results of this work showed that until January the ratio was maintained on the 2 level, then increased as the fruit ripened, and reached to the 4 level in May and June.

In this respect, natsudaidai may be considered to be a peculiar citrus fruit used for the juice manufacture.

The changes of total sugar and reducing sugar content are given in Table VI and Fig. 9.

The proportion of total sugar to reducing sugar is given in Table VII.

After the ripening of the fruits, the total sugar content increased and reached the highest value in April, and then decreased. The reducing sugar content also increased as the fruit ripened, especially after the mid-season. There were little or no changes about the proportion of the reducing sugar content to the total sugar from March and then it increased to reach the 60% in June, when the fruit, being of low acidity and of high sugar content, is considered to be at the optimum time of harvesting for best eating quality. The sugar content for the B, for which the lowest soluble solids were found throughout the period, were also lower than those for the A and the C; especially during the overmaturing period. The analytical data mentioned above agreed in general with those of Komatsu's.

The changes of ascorbic acid content are given in Table VIII and Fig. 10.

Throughout the season, the highest content of l-ascorbic acid was found in the A and the lowest in the B. The results of this experiment were similar in general to that which was obtained by Nomula.

The changes of pectin, pH values, and specific gravity of the juice are given in Table IX.

The pectin content, the determinations of which could not be carried out through the period, was generally below 0.1%, and decreased rapidly after May. The pH values, which could be estimated only after April, ranged from 2.8 to 3.0. Owing to the relatively high buffer capacity of the juice, large fluctuations in titratable acidity occurred without change in pH. During the growth of the fruit from the very immature to the mature state, the titratable acidity decreased more than 50% with less than 1 unit change in pH.

From the experimental results above mentioned, no definite relation was found between the compositions of the juice and the ages of the tree.

Analytical results showed that the content of total soluble solids, total sugar and ascorbic acid are higher in the tree A and the tree C than in the tree B. Of the size of fruit, similar results have been obtained in the experiment of valencia orange. (3) In general, the juice of the large fruit is better in composition than that of the small; however, the inverse result has been obtained for unshiu orange by Takahashi. (12)

The acid and the essential oil are always plentiful at the beginning of the season. (13) For the manufacturing of citric acid and oil from Natsudaidai, this fruit is more desirable at the early stages of its ripeness, while for eating as fresh fruit it should be harvested later in the season.

For the production of concentrated citrus juices, the manufacturer should desire, apart from the technical problem of the juice extraction, to obtain as much soluble solid of juice as possible from a unit weight of fruit.

In this respect, the advantageous season for processing of natsudaidai juice seems to lie in February, March and April. It is necessary to compare the changes of juice composition for industrial processing with the results mentioned above.

The author should like to report on this subject another time.

Acknowledgement: The author wishes to express his sincere thanks to Dr. T. Hiraizumi, President of the Takasago Perfumery Ind. Co., Ltd., for his helpful encouragement. In addition, the author is indebted to Mr. E. Matsuyama and Miss. Y. Natsume for their assistance in carrying out the experimental measurements.

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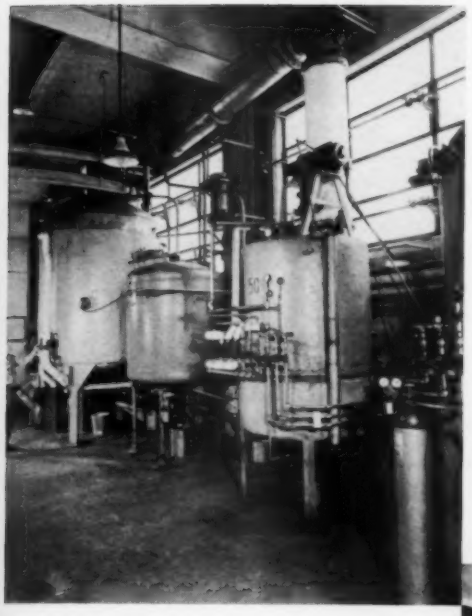

OLEORESINS FOR THE FLAVOR CHEMIST

EDWARD E. LANGENAU*

Vice President & Director of

Anayltical Laboratories

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Philosophy and Science have long been closely associated. It is to the early Greek philosophers that we owe the original concept of the atom—a concept born in the brilliant minds of men—a concept developed in the fifth century before Christ without benefit of experimental confirmation. At a much later date, it was the alchemist who sought the Philosopher's Stone with which to convert the baser metals to precious gold—with little success. When the technique of the experimental method became established, the alchemist graduated to the chemist. He, too, sought to convert one element into another and (without the benefit of the Philosopher's Stone) managed to convert precious Uranium into such baser metals as Barium—with much success.

In early times, the philosophers sought the one, important, individual factor that made one thing different from all others. This differentiating factor they called the "quintessence"—the "fifth element"; the other four were well known to every philosopher since the time of Pythagoras: earth, fire, air and water. And in the Middle Ages the alchemists, as philosophers, also sought this elusive element in things chemical and things medicinal. It is from this Greek concept, the idea of the "quintessence," that we derive the name "essential oil." What makes a spice, such as fennel seed, so different from a spice such as dillseed? Certainly not the cellulose, nor the starches, nor the fixed oil—but rather the volatile oil that can be distilled from the crude botanical with steam. From a hundred pounds of such a spice, perhaps two or three pounds of oil might be obtained; these few pounds represent the real usable value of the original one hundred pounds of botanical. Surely, this must indeed be the "quintessence."

However, it would not take a chemist very long to discover that the pungent ginger root and the sharp-tasting pepper corn yield on steam distillation oils that somehow do not represent the quintessence of these spices. Yes, the volatile flavor is there, but something is missing—the pungency. Obviously, the factors responsible for the strange pungent character are not volatile with steam. How else could these components be obtained? Perhaps by the preparation of *infusions*, the simple steeping and soaking of the powdered spice in a liquid such as water, vinegar or wine. To speed up the process and to increase the efficiency, the next step was indeed logical: *decoction*, applying heat during the infusion process so that the solvent was brought to its boiling point.

As the art of distillation progressed, wine was converted to brandy and finally to alcohol of even higher proof. And then began the age of *tinctures;* first, by simple *maceration* (steeping without heat), then by *digestion* (with heat), and finally by *percolation* (a process of extraction involving the flow of the liquid through

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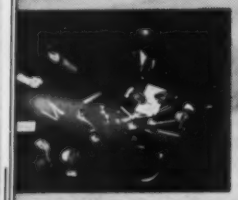

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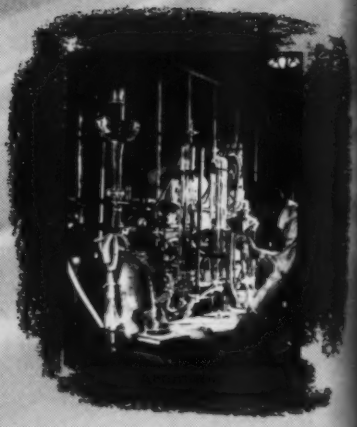

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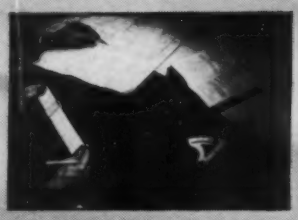

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the powdered botanical). But what should be the strength of such a tincture? Standardization was needed. This resulted in the development of the *fluid-extracts:* one milliliter of the tincture must contain the extractives, the active principal, of one gram of the spice or drug. Then came the *solid extracts* and finally the *oleoresins*, highly concentrated extracts from which all of the solvent used in the manufacture had been removed.*

In the case of the spices, it was soon discovered that water was a very poor extractant; alcohol was found to be much superior. And why not other solvents? After all, in the manufacture of oleoresins the extractant would be completely removed, so that solvents unsuitable for the preparation of a tincture or of a similar type of extract could be used for oleoresin production. As the chemical industry grew, new solvents became available, as well as solvents of higher purity: acetone, ether, benzene, alcohols (including methanol and isopropanol), petroleum fractions (such as hexane and heptane), ethylene dichloride, and even materials which at normal temperatures and pressures were gasses: propane, butane, yes, even carbon dioxide.

In the early revisions of the United States Pharmacopeia and the early editions of the National Formulary, alcohol and ether were the favored solvents; these were readily available to the pharmacist who often made his own oleoresins. It was not until the Seventh Edition of the National Formulary that acetone was permitted as a solvent for the preparation of Oleoresin Ginger N.F. The permissive use of acetone was the first indication that an official compendia recognized the fact that oleoresins were being produced commercially in relatively large quantities—not by the pharmacist, nor in the laboratory—but in a processing plant.

PROCEDURE FOR OLEORESIN MANUFACTURE

Let us briefly consider the procedure to be followed for the manufacture of oleoresins.

Spices

First, the proper spice must be obtained. In most cases, there are commercially available several geographical sources and often several varieties of the botanical as well as several established grades. The choice will often depend not only on quality considerations and trade preferences, but, also, on economic considerations, such as basic cost and availability of the spice and relative yields of oleoresin. Often different types of oleoresins are demanded by different industries; for example, many soft drink manufacturers prefer the Jamaica type of Oleoresin Ginger with its pleasing top notes, while the meat industry is more interested in the heavy-bodied, pungent African oleoresin.

Often several grades of spice are available. In general, the type used by the spice trade for grinding is the type employed for oleoresin manufacture. The wormy, reject nutmegs used for oil distillation may not be used for oleoresin extraction; only sound nutmegs suitable for grinding are permitted. An exception should be noted in the case of black pepper. Here, the light berries (low in starch content) give higher yields of oleoresin. The grinders, however, prefer the full, round, heavy berries. The separation of these two types of peppers is the basis of a patent* held by one of the oleoresin manufacturers.

* It should be noted that the order described above (i.e., from infusion to oleoresin) may not be historically accurate, but it does represent the logical development of the processes of extraction.

* U.S. Patent No. 2,713,000

Solvents

After the spice has been selected, the next problem is the proper choice of solvent.

A solvent used for oleoresin manufacture should be of high chemical purity. It must be free of any high boiling residues; these residues often have unpleasant odors which are difficult to remove from the oleoresin. The determination of the boiling range and a simple blotter test will show whether or not a solvent is free from such objectionable high boiling fractions.

The solvent selected should have a low boiling point to facilitate its complete removal from the oleoresin. However, it should not be so low that excessive losses of the solvent result during its recovery and purification for reuse. Solvents having very low flash points or subject to peroxide formation (such as diethyl ether) introduce fire hazards in the factory.

As a general rule, the use of a non water-soluble solvent is to be preferred. If a water-soluble solvent (such as alcohol or acetone) is used, the moisture in the botanical will dilute the solvent, so that the spice is actually extracted with a solvent-water mixture. This will often result in the extraction of non-flavor components such as starch-like and sugar-like materials as well as water soluble resins and gums. For most spice extractions, this is undesirable, since it causes difficulties during the removal of the solvent and during the final concentration of the extract. Also, as the water is vaporized, a steam distillation of the essential oil may occur. The resulting oleoresin frequently is not homogeneous; separation of a sludge often occurs on storage. Poor solubility of the oleoresin in fixed and essential oils sometimes results. (It should be noted, however, that in the case of certain botanicals, such as vanilla beans, an aqueous type of solvent is desirable and actually necessary in order to obtain certain flavorful water-soluble extractives.)

In general, a solvent is preferred which is immiscible with water and in which water will not dissolve to any appreciable extent. Ethylene Dichloride is a good example of a commonly used non-water soluble type of solvent; the lower aliphatic alcohols and acetone are examples of commonly used water soluble solvents.

Manufacture—(Grinding, Extraction, Removal of Solvent)

Now that we have chosen our spice and our solvent, we are ready to consider the manufacturing process.

First, the spice must be ground. The selection of the proper grind for each individual spice is very important. If the spice is not comminuted sufficiently, slow and incomplete extraction results with correspondingly low yields and loss of certain desirable flavor components. Even small seeds (such as caraway and celery) must be cracked or ground to permit proper extraction. If, on the other hand, the spice is ground too finely, the separation of spice and solvent becomes difficult and involves expensive filtration techniques. The solvent may not penetrate the well-packed mass, leaving dry areas untouched by solvent. Also excessive loss of essential oil may occur as a result of the heat of grinding and the increase of exposed surface area. To minimize loss of volatiles, all spices should be extracted immediately after grinding. Through experiment and experience, manufacturers have ascertained for each botanical which type of grind is best suited for their process and their equipment.

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tractor is loaded with a substantial amount of freshly ground spice, perhaps 5 tons. Sufficient solvent is pumped from a storage tank into the extractor to cover the botanical. Heat is applied, if necessary, and the solvent circulated by means of a pump. This is continued until the solvent is saturated, the time required having been determined from previous experiments. The solvent is then drained off and the process repeated with fresh solvent. Meanwhile, most of the solvent from the first extraction is distilled or stripped off for reuse in a future cycle or for purification. After a sufficient number of cycles to assure complete exhaustion of the spice, the combined crude oleoresins are transferred to a vacuum still for final removal of the last traces of solvent. If this partially concentrated extract has separated into two layers, (as sometimes happens when using water soluble solvents) the aqueous layer is withdrawn at this point and discarded or further processed. The crude oleoresin still contains traces of water and solvent which are removed at low pressure, care being taken not to distill off the essential oil. The final traces of solvent can be driven off by additions of small amounts of an innocuous solvent (usually ethyl alcohol) and repeating the final distillation step.

The hot oleoresin is then run into cans or drums or further processed if necessary. Oleoresins prepared from seeds (such as Celery) require no further additions since the fixed oil present in the seed results in sufficient fluidity of the oleoresin. However, oleoresins prepared from leaf material (such as Sage) and from bark material (such as Cassia) show a thick tar-like or hard rosin-like consistency upon cooling. In order to convert such oleoresins into a usable form, it is customary to make additions of the corresponding essential oils. In some cases, Propylene Glycol (or other food grade solvent) is added. Recently, a Federal Specification* has been issued which includes definitions of such oleoresins. This publication should help to standardize the various products offered to the trade by different manufacturers.

ADVANTAGES and LIMITATIONS of OLEORESINS

In order to use properly a product such as an oleoresin, we must know what it is and how it has been prepared. (We have covered in some detail this aspect in the preceding discussion.) In this way, we can better understand the advantages, disadvantages and limitations of use. We know, for example, that an oleoresin is a concentrated extract of a spice, containing not only the essential oil, but also non-volatile, resinous material and other extractives, all of which contribute to the overall flavor. Consequently, the oleoresin, both in theory and in practice, approaches the flavor of the original spice more closely than does the essential oil. Because of the method of preparation, it is more concentrated than the spice itself, but much less concentrated than the essential oil. Since the oleoresin is an extracted product, it is usually highly colored; in some cases, this proves to be such a disadvantage that a decolorizing step must be introduced during manufacture. But even decolorized oleoresins have considerably more color than the corresponding essential oil.

Since oleoresins contain a large percentage of non-volatile components, they can be used advantageously in baked goods and in other finished products which must be subjected to high temperatures during processing. On the other hand, because of these resinous extractives, the solubility of most oleoresins in dilute alcoholic media is poor.

As a replacement for spices, oleoresins offer a convenient way of standardizing the quality and strength of flavor. Storage problems are greatly simplified. Danger of insect and rodent contamination is eliminated. No loss of flavor strength due to evaporation of the essential oil occurs during storage. Adequate inventory can be maintained with much less warehouse space.

Flavor chemists should remember that a combination of oleoresins with essential oil (or other flavoring materials) frequently will prove to be the answer to a difficult flavor problem. And in such mixtures, the oleoresin will contribute a definite fixative effect.

It should be pointed out that the analytical evaluation of an oleoresin is much more difficult than the evaluation of an essential oil. This is due primarily to our present lack of information and knowledge of the composition of oleoresins. In time, however, this problem will be solved, probably with the aid of the newer instrumental and chromotographic techniques.

Conclusion

Today, oleoresins occupy a small, but important, part of the flavor chemist's shelf of basic raw materials. Yet, for almost every commercial spice, there is available at the present time a corresponding oleoresin. Unquestionably, new and more useful types of oleoresins will be developed as well as special oleoresins designed for specific flavoring problems. And, there will become available a great number of oleoresins made from natural products other than the spices.

The future looks bright indeed for oleoresins.

Appendix

A Partial List of Commercially Available Spice Oleoresins

Oleoresins derived from *seed* material:
- Dill
- Celery
- Caraway
- Fennel
- Parsley
- Anise
- Cardamom
- Coriander
- Cumin
- Nutmeg & Mace

Oleoresins derived from *leaf* material:
- Sage
- Thyme
- Origanum
- Marjoram
- Bay (Laurel)
- Basil

Oleoresins derived from *bark* material:
- Cassia
- Cinnamon

Oleoresins derived from *fruit* material:
- Pimenta Berries
- Black Pepper
- Capsicum
- Red Pepper
- Paprika

Oleoresins derived from *root* material:
- Ginger
- Turmeric

Oleoresins derived from *bud* material:
- Clove

* Federal Specification "Spice Flavorings; Soluble." EE-S-645.

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USE OF **MODERN INSTRUMENTAL ANALYSIS** IN THE **EVALUATION** OF **FLAVOR MATERIALS**

DR. ERNST THEIMER

Instrumental analysis and in particular the modern methods of spectroscopy, aided by the separation techniques of chromatography, have provided the greatest impetus to organic analysis since the beginning of that science.

These techniques which are particularly valuable for those volatile organic compounds in the approximate molecular weight range of 100 to 300, are, therefore, applicable to the problems of flavor analysis, since the materials used in flavors fall into this same category.

For the purposes of this discussion, it shall be assumed that the problems of fragrance and flavor are one and the same, and the examples chosen are mainly those from the fragrance field.

Until quite recently, organoleptic examination was the only criterion of the value of fragrance materials. Gross physical characteristics of chemicals, such as refractive index, specific gravity, supplemented by approximate chemical analyses such as ester values, acid values, and hydroxyl numbers served only to give an average number particularly where mixtures were concerned. Spectral analysis, however, is now able to supplement the organoleptic analysis and provide a characteristic fingerprint of the authenticity of any particular sample. In the few minutes available, no comprehensive survey can, of course, be made but a few examples may be cited.

The ultraviolet absorption spectrum of a mixture of ionones or methyl ionones will supplement the hydroxylamine test which gives the total ketone present, by distinguishing between the triply conjugated beta forms, such as β—ionone and beta and delta methyl ionones, as contrasted with α—ionone and alpha and gamma methyl ionones. The latter being doubly conjugated will have absorptions in a different part of the ultraviolet spectrum.

The infrared spectrum will give further supplementary data distinguishing readily between all the types mentioned above and also showing up the presence of minor impurities which may be present, for example, pseudo ionone or methyl heptenone. These spectral methods are, of course, valuable from a quantitative standpoint only with relatively pure materials since the spectra of mixtures rapidly become so complicated as to defy evaluation other than empirically. However, this empirical analysis in itself is extremely valuable to monitor the reproducibility of an essential oil or compounded mixture. The infrared spectrum when made on a reliable instrument such as a double beam Perkin-Elmer Model 21 serves as a fingerprint of such a mixture, which fingerprint can scarcely be reproduced by any other components than those present in the original.

In the same way the adulteration of essential oils can be readily detected. The addition of foreign components added to simulate the proper composition, as shown by physical constants and chemical analysis, will be readily revealed by the appearance or disappearance of the characteristic peaks at the proper intensities for the natural components. Even a minor change, such as the substitution of a methyl for an ethyl ester, for example —a change which would often be unnoticeable by odor evaluation—will be readily apparent in the infrared spectrum. Whenever the materials possess functional groups with outstanding absorption characteristics they will be readily distinguished by IR. Undecylenic aldehyde of commerce has an unsaturation in the terminal position and this can be detected readily as distinguished from undecylic aldehyde. On the other hand, if the doubt bond is in any of the internal positions, it can no longer be differentiated by IR even though the odors of all the materials are quite similar. Conversely, Nerol and Geraniol, whose odors are substantially different, are not readily distinguished by IR except as pure material because their characteristic absorption peaks fall too close together.

But while the empirical examination of mixtures is of value, the greatest source of information spectrally comes from the study of pure materials. The use of chromatographic separations and, in particular, gas liquid partion chromatography, accomplishes the vital function of separating a complex mixture into its pure components or at the least into a large number of groups of relatively simple mixtures. Of course, the proper conditions must be found to accomplish these separations most effectively and the art of GLPC has been pursued intensively during the last few years, progress having been made in the study of proper operating parameters.

Continued on page 69

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CONTRIBUTION TO THE PROBLEM OF POSSIBLE . . .

Skin Irritations by Lipsticks

OTTO J. JACOBI, Ph.D.*

Scientific investigations of the effectiveness of cosmetic preparations are of great importance for two reasons. First, such investigations permit the development of cosmetic products of highest usefulness. Secondly, the investigations avoid possible damage to the human skin by cosmetic products.

The problem of irritation and damage of the skin by cosmetics has been the subject of several scientific investigations, especially during the last years. A. F. Guiteras (1) studied the question of checking cosmetics as to the safety factor against injuries on the skin. J. F. Morse (2) dealt with the problem of allergenic and true irritations of the skin caused by cosmetics. L. C. Barail (3) studied the bacteriological and dermatological testing procedures of cosmetic products. V. Brabetz (4) published a summary of possible injuries caused by cosmetic products and cosmetic procedures. H. C. Friederich (5) dealt with the problem of irritation by lipsticks. E. Sidi (6) summarizes in his excellent book irritations and damages of the skin by cosmetics.

One question arises. Why is it that only in the most recent time have we become interested in the mechanism of cosmetic action and irritations caused by cosmetics on the skin? Could it be that in former times no positive reactions had been observed? As a matter of fact, injuries of the human skin caused by cosmetics are known as long as cosmetics have been used and that goes back almost to the beginning of history. However, the problem of irritation has become more and more the center of interest. That is due to the increased and more general use of cosmetic products plus the fact that a relatively small percentage of complaints may amount to a number of them if enough people use cosmetics. Another contrasting factor is the insistence of the modern user of cosmetics for truly scientific established effects. Finally, the current interest in this matter is due to the recent legislation regulating the manufacture and sale of cosmetics. Especially, here in America, the stringent conditions of the Federal Food, Drug and Cosmetic Act have resulted in better control of cosmetic products.

It is to be regretted that even today a truly cosmetic science is only in the infancy of its development. Measuring procedures are hardly known. Skin irritation is almost exclusively measured by patch testing, a method borrowed from dermatology or the study of allergies. Cornea testing borrowed from pharmacology is another testing procedure. Lacking a general method of investigation, every test on a cosmetic product is a scientific investigation which many times means a fundamental piece of research. In order to study intelligently the positive usefulness and the possible injuries to the skin by cosmetics, one has to know, first, how and where the cosmetic actually lodges on the skin. If one knows the exact place or the course of penetration of a cosmetic, then one can draw conclusions as to the effectiveness and possible methods of investigation.

In light of the above discussion and in view of the fact that we are dealing with lipsticks, the basic question is: How does the lipstick actually attach itself to the skin? Putting it differently, are only the most external cells of the skin of the lips stained or does the stain penetrate through several layers of cells of the corneum? One could even think that the stain goes deeper, perhaps into the corium which carries the blood vessels. Another question has to be settled, namely; is the film or stain continuous or discontinuous?

The answer to these questions requires that the film or stain produced by the lipstick be made more visible. To study this problem correctly, all observations should be made on the living skin or at least on freshly detached untreated skin segments. All histological methods which work with fixatives or preservatives may cause the leaching out of the dye. This removal of the dye would make all observations pointless and without value, since we are principally interested in places where the stain occurs.

As early as 1923, Von Willer (7), by means of microscopic top illumination, attempted to observe living tis-

* Kalmar Research Center, Milwaukee (U.S.A.)—Wiesbaden (Germany).
**Reprinted from the Proceedings of the Scientific Section of the Toilet Goods Assn. No. 30, December, 1958.

sue while it was in its natural place on the body. However, his investigations dealt only with animal skin with the single exception of the investigation on human finger nails. Bettmann (8) observed the fine structure of the skin surface by means of skin dermatograms. This means an observation of skin structures by means of transferred color or ink stains. O. Müller (9) used an improved top illuminating mocroscope in his extensive and fundamental investigation of the capillaries of the body. R. and F. Jaeger (10) developed a method for the observation of structural changes of the skin surface by staining the corneum with fluorescent dyes and then making the observation by top illumination of fluorescence producing light.

All quoted investigations deal with medical questions only. Microscopic investigations of the human living skin to clarify cosmetic problems have seldom been used. Of the several methods used in medical research, we can use for our problem only the observation of the skin with top illumination.

Experimental Procedures

Using previously developed techniques, a study of lip tissue was undertaken. The work was planned along the following lines: Lipstick is to be applied to the lips and photographs of the stained lips were taken at different magnifications. Up to four times magnification would be obtained by using the camera only. The next step in the magnification was produced on the lips directly using a microscope with top illumination. In order to study how deep the lips were stained small pieces of skin were detached and studied with ever increasing magnification; first by top light and then with transmitted light. Examination with transmitted light used normal optical equipment. The cut off skin segments were investigated right after they were cut off the skin and were not prepared or fixed in any way.

Modern "kiss proof" lipsticks contain for true staining, derivatives of eosin acids. If such a lipstick is applied to the lips and the existing wax mass is wiped off after 20-40 minutes, one notices visually a uniform red staining of the lips. Picture 1 is a picture of such stained lips. It represents one-half natural size.

Picture 2 is the same mouth 1:1 magnification. Picture 3 shows the mouth 1⅓ times normal. In this picture we now see the lines in the lower lip.

Picture 4 still more enlarged and represents twice the normal size. The surface structure of the lower lip is brought out more clearly. The staining of the lip still appears to be uniform.

Picture 5 shows the lower lip of the same mouth at four times magnification. Although the magnification is still rather slight, the surface of the lip has lost its uniform character. In spite of shadows and light which bring out the cracks in the lips, one notices that there seems to be discontinuities in coloration, which seems to indicate an uneven distribution of lipstick stains on the lips. This is even noticeable on the high spots of the skin.

With this picture we have reached the limit of magnification by lens and have to switch to microscopic investigation in order to study possible uneven staining of the lip. In Picture 6, we have the area indicated by an arrow in Picture 5 magnified 50 times. This photograph is taken by means of top illumination and clearly shows the discontinuity and the uneven staining which we suspected to exist from Picture 5.

Actually, a lipstick produces a discontinuous color film on the skin. In addition to the fact that the film is discontinuous, we notice in Picture 6 the peculiar distribution of dye stain. We find loose or overhanging ends of skin are strongly stained together with spot like staining throughout the high fields of the skin. These pointlike color stains seem to be the edges of small shingle like skin layers. The dark colorations in Picture 6 are real stains since we have eliminated the effect of light and shadows by using top and not side illumination and by flattening the skin the immersion cap of the Leitz Ultopak optics which levels out structural unevenness of the skin.

Picture 7 shows at 88 magnification such a point-like stained region in the middle of the area between two cracks. It is the same area which is indicated by an arrow in Picture 6.

It is surprising how clearly the photomicrographs show the local nature of the red stain in spite of red background given by the color of the lip skin and the difficulty of getting enough light by mere top illumination. That the dark areas are really stained is evident if one compares Picture 7 with Picture 8 which is a photograph (75X magnification) of the skin of the lips to which no lipstick has been applied. An inspection of this picture shows not distinguishing structure because top illumination and the flattening out of the skin eliminates light and shadow effects. However, in Picture 7, structure of the skin has been stained by dye and as a consequence is clearly distinguishable.

Unexpected also, were the observations which are shown in detail in Pictures 9 and 10. If one applies lipstick to the lip and does not wipe off the excess, the lipstick mass is primarily on the high spots of the lips while the cracks and furrows of the skin are skipped by the lipstick mass. If the lipstick is then wiped off the high spots, the lipstick mass is now in the cracks and furrows, which now seem to be solidly colored while the high spots only have coloring in certain points. These pictures were taken at a magnification of 50 times.

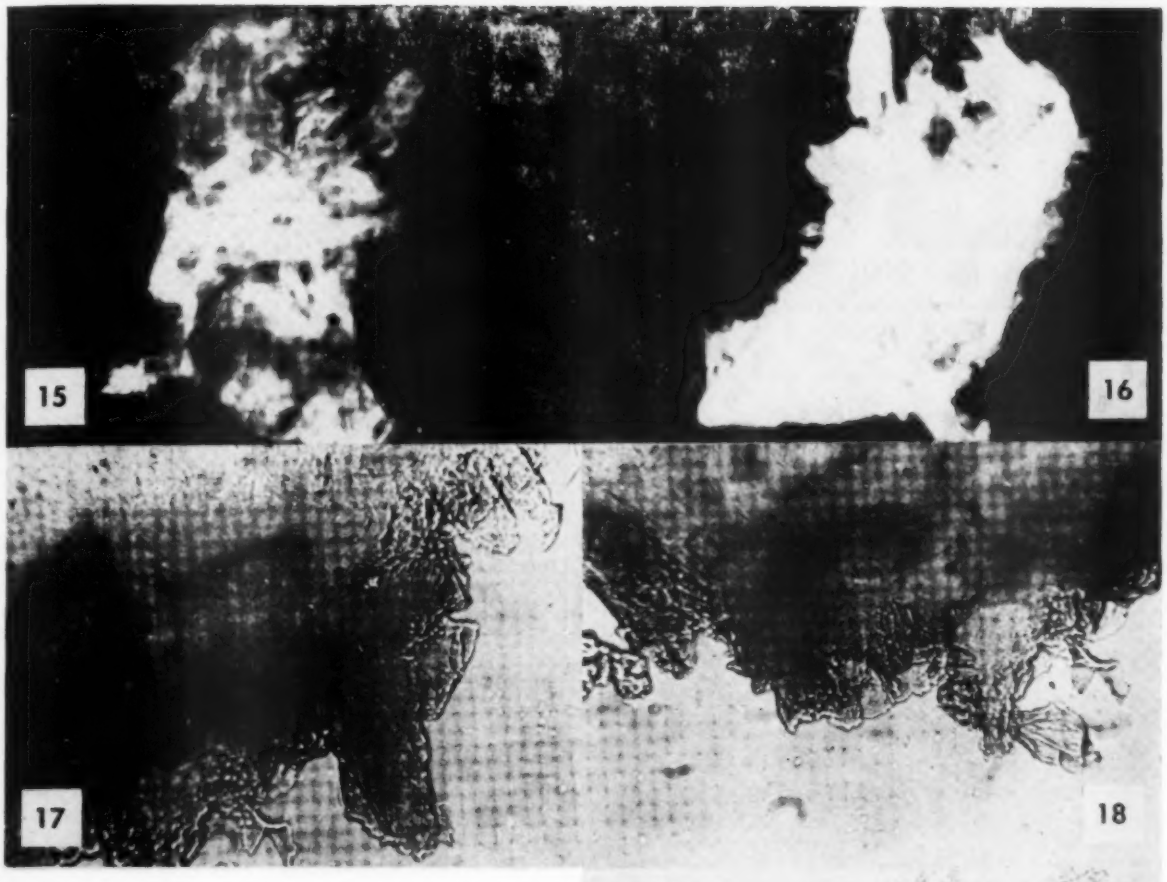
From this observation we reach the conclusion that the recessed regions of the lip receive lipstick only after wiping the lipstick mass off. Another interesting fact has to be considered and that is the staining of the area between cracks only in certain spots and not across the entire region. This is really remarkable considering that the lipstick mass was in continuous contact for about 30 minutes before being wiped off and yet only certain spots of this elevated area are capable of accepting stain. In order to check whether the coloration which seemed uniform on these few localized points was really uniform and continuous, and to find out how deep the stain actually penetrates into the skin small colored pieces of skin were cut off. The cut off pieces of skin were approximately .3 by .2 mm, and they were about .01 mm in thickness. If one checks the area from which the pieces of skin segments were removed, one notices that they are practically colorless. That means that the stain does not even penetrate the skin to a depth of .01 mm.

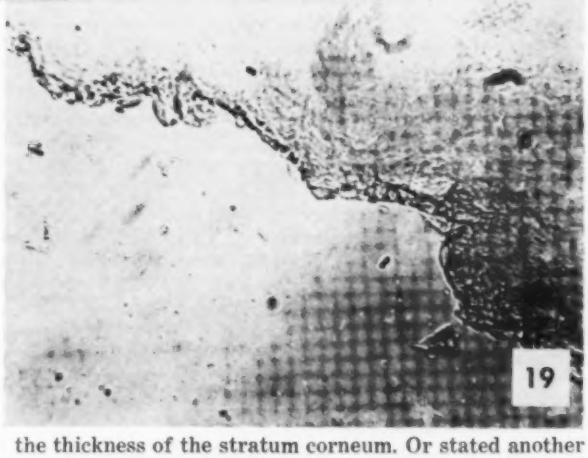
Pictures 11 and 12 show the view of the skin after deeply colored spots have been removed from it. Surrounding the unstained cut off area, one sees the originally stained skin. The smallest dark points in the region from which the pieces were detached are capillaries which are defusily visible. The larger darker areas are still originally stained skin which were left because the scalpel did not remove the skin in one piece.

Because we discuss in detail the appearance of the skin segments removed from the skin, let us make some calculations in regard to the thickness of the skin removed. According to A. A. Maximov and W. Bloom (11), we find that the thickness of the epidermis varies between .05 and .12 mm. In the palma manes and in the palma of the fingers the thickness reaches .8 mm and may go up to 1.4 mm, for the sole of the feet and toes. According to Maximov and Bloom and also to S. Schumacher (12) the skin of the lips differs from the regular

Picture 1—Mouth with lipstick applied at ½ magnification.
Picture 2—Mouth with lipstick applied at 1 magnification.
Picture 3—Mouth with lipstick applied at 1½ magnification.
Picture 4—Mouth with lipstick applied at 2 times magnification.
Picture 5—Lower lip with lipstick at 4X magnification.
Picture 6—Micro-view of lip stained with lipstick using top illumination. 50X magnification.
Picture 7—Micro-view of lip stained with lipstick using top illumination. 88X magnification.

Picture 8—Micro-view of lip without lipstick using top illumination at 75X magnification.
Picture 9—Micro-view of skin with applied lipstick but without wiping. 50X magnification.
Picture 10—Same view as picture 9 but after wiping. 50X magnification.
Picture 11—Section of skin from which a segment of stained skin has been removed. 80X magnification.
Picture 12—Section of skin from which a segment of skin has been removed. Top illustration. 80X magnification.
Picture 13—Stained segment of skin after removal. This piece is viewed from the side of the skin which was not attached to the main part of the skin. Top illumination. 80X magnification.
Picture 14—Same as picture 13 but this is a view of the area which was attached to the main part of the skin. Top illumination. 80X magnification.





Picture 15—Same as picture 13 but with 130X magnification.

Picture 16—Same as picture 14 but with 130X magnification.

Picture 17—Strongly stained edge of skin segment. Transmitted light. 500X magnification.

Picture 18—Same as picture 17 but a different region.

Picture 19—Unstained edge of skin segment. Transmitted light 500X magnification.

skin and the mucous membranes by its lack of hair, its somewhat thicker epithelium, and the fact that the papilla are more numerous and reach closer to the upper layer of the skin. In effect, the skin of the lips is a transition area between the regular skin of the chin and the mucous membrane of the mouth.

The skin of the lips has a typical stratum corneum. If we consider the thickness of the epidermis of the lips to be the lowest value given by Maximov and Bloom, namely 0.05 mm and the thickness ratio of the stratum corneum to stratum Malphigii is 1; then the removal of a skin segment 0.01 mm thick represents only 40% of the thickness of the stratum corneum. Or stated another way the staining of the lips only penetrates to a depth of ⅖ths of the horny layer of the epidermis.

The above considerations are furthermore substantiated by the microscopic pictures of the stained segment which was observed from above and from below. Picture 13 represents a skin segment observed from above (80 times magnification).

Picture 14 is the same segment, same magnification, but viewed from the underside. That means the region

Continued on page 69

PAUL Z. BEDOUKIAN, PH.D.
Author of Perfumery Synthetics and Isolates

Progress in Perfumery Materials

PART 2

STUDIES IN TERPENES—Norman's discovery of the formation of vinyl Grignard reagents has been used in the preparation of terpenes synthetically. This is described in a French patent (131). Conditions for the manufacture of hydroxycitronellal are described in an American patent (132). Beta terpineol has been prepared by thermal decomposition of terpin diacetate (133).

Pyrolysis of myrtenyl compounds converts them to cyclic or acyclic compounds which can be separated by fractional distillation (134). Various monocyclic terpene compounds were obtained by treatment of verbenol with acidic agents (135). Verbenol compounds were obtained from 3-pinen-2-ol, the latter prepared from alpha pinene (136). A novel synthesis of phellandral was reported in a British publication (137).

Menthenes and their oxides (138), as well as pulegone oxide (139) were prepared and studied. The isomeric fenchenes obtained by dehydrating alpha and beta fenchol were also subjected to a thorough investigation (140). A process for the conversion of 1-carvoxime to 1-carvone was described in a recent patent (141). Other patents describe the pyrolysis of alpha pinene to pinocamphone and carveol (142) and the conversion of sobrerol diacetate to carvyl acetate (143).

Tremendous quantities of peppermint oil and menthol are used annually by the pharmaceutical and toilet goods industry. It is therefore not surprising that much work is carried out constantly to discover newer and better methods of manufacturing menthol. An improvement in the method of manufacturing piperitone from ethyl acetoacetate was reported (144). Another report described the synthesis of piperitenone oxide and diosphenolene (145). Piperitone can be dehydrogenated to thymol by treatment with catalysts under suitable conditions (146). Thymol isomers can be rearranged to a single isomer by heating in the presence of sulfuric acid, according to a German patent (147).

A study was made of the isomeric menthols obtained by reduction of the corresponding ketone with different methods (148). Condensation of alkylated phenols with ketones gave thymol which on hydrogenation gave the corresponding menthol (149). Geometrical isomers of menthol which have little commercial value can be converted to the valuable racemic dl-menthol by treatment with finely pulverized silica according to a recent American patent (150). Purification of synthetic menthol is carried out by selective oxidation of the mixture as described in another patent (151). Campholic acid has been found to be suitable for the separation of dl-menthol into its optical antipodes (152).

SESQUITERPENES—Degradation studies on costol and beta selinene gave the same tricarboxylic acid, indicating their relationship (153). Further evidence of the structure of alantolactone as obtained by its conversion to dihydroeudesmol (154) and various other derivatives (154a). Alantolactone has been separated from isoalantolactone by fractional crystallization (155). Continued studies on the constitution of acorone obtained from sweet flag oil have substantiated the previously assigned structure to this very unusual compound (156). Various degradation products of gurjunene were prepared and structures for these compounds proposed (157).

RESEARCH ON ESSENTIAL OILS—Studies on lavender oils disclosed the presence of cineole by the application of infrared spectrophotometry (158) (159). Lavender is differentiated from lavandin by its higher camphor content which can be determined by infrared spectrophotometry, or better still, by gas chromatography (160). In a study of technological factors affecting the yield and quality of lavender oil, it was found that tin-plated equipment gave more oil with a higher ester content, than the conventional copper units (161).

American spearmint oil was shown to contain cineole. In this case, a technique involving column chromatography was used to separate and purify cineole in the presence of large quantities of oxygenated materials (162). In a general examination of mint oils, it was found that dihydrocarvone occurs in several species of mint oils containing carvone. Jasmone was shown to be a constituent of American spearmint oil and menthofuran to be a major constituent of Mentha aquatica (163).

A wide range of constitutents of Mentha sylvestris have also been determined (163). Three studies report the properties of mint oils obtained in Brazil (164), Bulgaria (165) and India (166).

New studies have been carried out on the structure of the oxide of the troublesome menthofuran (167) (167a).

The "high class" note of many perfumes is due at least in part to the presence of vetivert or vetiveryl acetate in the formulation. The importance of this oil to our industry is indicated by the number of interest-

ing articles dealing with this oil. The structure of the tricyclovetivene from Belgian Congo vertivert oil was elucidated in recent studies (168)(169). Vertivert oil is also obtained in India and some of the properties of this oil were studied (170). The oil from India was found to contain bi- and tricyclic vetivenes, bi- and tricyclic vetiverols, beta vetivone and also two solid sesquiterpene alcohhols and a sesquiterpene ketone, in addition to other constituents (171). An informative and interesting article discusses the sources and production of vetivert oils (172).

MISCELLANEOUS ESSENTIAL OILS—Various interesting reports have appeared indicating research on essential oils in all parts of the world.

There has been an increase in efforts to cultivate a wider range of essential oil bearing plants in Europe. Bulgaria, Yugoslavia and Hungary have long been major sources for a number of essential oils. Reports on Bulgarian Juniper oil appeared in Bulgarian and Italian publications (173) (174), and on Bulgarian oils of Zdravetz, coriander, basil, juniper and chamomile in another article (175). Similar reports appeared on Yugoslavian salvia officinalis, mentha piperita, coriandrum sativum, carum carvi, foeniculum, vulgare and artemisia annua (176). Another article describes Yugoslavian chamomile oil (176a). Hungarian petitgrain was reported to contain close to 40 per cent aldehyde calculated as citral, and a considerable amount of neryl acetate (177).

Soviet publications have dealt with the essential oils of valerian (178), labdanum gum (179) and artemisia which is reported to contain agropinene and a hydrocarbon with twelve carbon atoms (180).

Some of the unknown components of valerian oil have been isolated. These include the sesquiterpenoid ketones valeranone and valerenone, related hydrocarbons, sesquiterpene alcohols, etc. (181). The presence of 1-citronellal in the oil of Citrus hystrix leaves is worthy of note since it can serve as a source of the valuable 1-citronellol (182). Two other European publications deal with the examination of various thyme oils (183) (184). Physical and chemical examinations of lovage oil were reported in a recent publication (184a).

Essential oils obtained from plants grown on the American continents have also been studied. Argentinian camphor bearing basil (Ocimum kilimanscharicum) was found to contain over 75% camphor (185). Other Argentinian oils studied included a species of Labiates (186) and verbenaceae (187). The Brazilian oil of Fagara arenaria was shown to contain mainly terpenyl acetate; the fruit of Acrodiclidium puchury gave an oil reminiscent of the sassafras-eucalyptus oils, and the bark of Aniba canelilla gave an oil recalling lemongrass-cloves in odor (188).

Examination of essential oils from plants cultivated in New Guinea showed that the oil of Cinnamomum culilawan consists largely of eugenol, and the oil of Cryptocarya, safrole. New Guinea citronella oil had a total geraniol content of about 90 per cent. The properties of vetivert oil and patchouli oils were also reported (189). The wood of Brazilian Ocotea fragrantissima gave an oil possessing a sassafras odor (190).

The huge Asiatic land mass has always been an extremely important source of essential oils. Methods have been developed for analyzing camphor in the presence of linalool in ho-leaf oil (191). A new ketone named rotundifolone was discovered in the essential oil of Mentha rotundifolia (camphor tree) and its structure elucidated (192). As a result of comparative examination of oils of Mentha rotundifolia from different sources, it was concluded that the French strains of this plant are identical with those of Japan and America (193). The dry grass of a variety of Cymbopogon martini from Kashmir yielded an oil with a total alcohol content of 66 per cent calculated as geraniol (194). Indian curry leaves gave the characteristic yellow oil with a clove-like taste. Some of its components were characterized (195). Various components of the essential oil of Cryptomeria japonica leaves and Biota orientalis wood were determined and reported in Japanese publications (196). Other reports included studies on Artemisia annua oil and investigations on the structure of artemisia alcohol and ketone (197). Various constitutents of Magnolia kobus and salicifolia were also studied (198).

Ethiopia is potentially a producer of essential oils and in view of this fact it is of interest to note studies on some oils from this country, e.g. on the Ethiopian oil of salvia schimperi (199). Ecological conditions affecting the quality and yield of oil of Meriandra Benghalensis were discussed in another publication (200). The citronellol content of the distilled fractions of geranium oil from the Belgian Congo were found to be slightly lower than in the native oil (201). Various essential oil producing areas in Africa were discussed in an authoritative article, with special reference to eucalyptus, vetivert oil, geranium, and oil of Leptospermum (202).

The production of clove oils (203) and oil of Eucalyptus citriodoro (204) was described in two interesting articles by a well known author.

SOME NOTEWORTHY BOOKS AND REVIEWS—The long awaited book by Maurer has at last appeared under the title of "Perfumes and their Production." It is a "must" book for perfumers and several reviews in trade journals attest to the excellence of this volume (205).

The most comprehensive annual review publication on our industry is still the "Miltitzer Berichte uber Aetherische Ole, Riechstoffe usw." the latest volume being the 1957 edition (206).

The appearance of the Fritzsche Bulletin is a welcome source of information containing titles of publications of interest to our industry (207). The fact that the material in the Fritzsche Bulletin consists largely of recent data adds greatly to its usefulness.

A small booklet titled "Molecular Structure and Organoleptic Quality" contains a great deal of thought provoking material seldom found in a book of this dimension (208). It includes papers read at a symposium held in Geneva in May, 1957 and eight papers by various authorities.

A number of excellent review articles were published during the past year which are of interest to our industry.

Recent progress of the synthetic perfume industry in the Soviet Union was reviewed in a Japanese publication (209). Another Japanese publication reviewed general progress in synthetic prefumery materials in the past ten years (210).

Again the most recent advances in terpenoid chemistry were reviewed in Czechoslovak and British papers (211, 211a).

An excellent review article summarized some new methods of organic chemistry of particular interest to the perfume industry (212).

A review on recent advances in the chemistry of sesquiterpenoid lactones (213) and another on recent advances in sesquiterpenoid chemistry (214) are of special value to those wishing to keep up with some of the fascinating work done in this most difficult field of organic chemistry.

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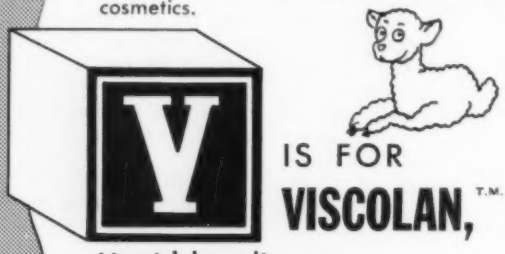

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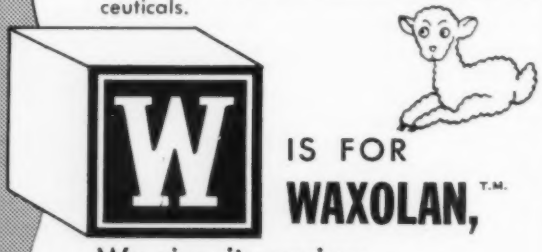

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Another article on the chemistry of naturally occurring furans is also worthy of special mention (215).

This is the author's fifteenth annual review article on progress in perfumery materials (216).

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NEW FLAVOMATICS

of Interest to the Flavor Chemist

LOUIS HETTIGER*

I felt sincerely honored when asked to speak before you at this meeting. However on deeper reflection on the subject matter of the talk I became doubtful of that honor. The title "New Flavomatics" somehow made me uneasy. Particularly now when we are all wondering how many of the older flavomatics we have left to work with, when even some of the old standby's, the essential oils, naturals and isolates are suspect for one reason or another.

The food additives amendment to the pure food laws as enacted in September of this year may prove a very serious obstacle to the introduction of new flavomatics to the industry. New flavomatics may soon be a thing of the past since in order to introduce a new flavomatic the manufacturer must have complete toxicity studies made upon this material, these studies to include not only the so-called acute and sub-acute oral toxicities but also chronic studies, the minimum time element for these studies being two years. Also it must be thoroughly investigated for possible carcinogenic effects, dermitologic effects and sensitization studies. If all of these studies should prove its safety under normal usage at predetermined upper limits, the manufacturer still must show that this would definitely be more beneficial or desirable than some existing approved material, a thing not easily proved by the necessarily subjective methods used to determine superiority in our business. Another of the normal requirements for approval of a new material for use as a food additive is that methods be included, in the petition, for determining the amount of the additive present in the food or food substances.

In the case of flavors, usually a complex mixture of materials, in many instances of similar chemical constitution this could pose a very serious problem if the F.D.A. should decide to adhere to the letter of the law as regards flavomatics. You are all familiar with the difficulties inherent in the analysis of a flavor or extract, which makes exact duplication an almost impossible task; this task may become almost impossible when a single constituent must be determinable after adding that flavor to the finished food product.

It has been shown that these studies could add up to as much as $40,000.00 or $50,000.00. To spend this sum or commit one's self to this type of expenditure on something which may never materialize financially would seem quite foolhardy to the average business man. In discussing this new law with other members of the industry it seems to be the consensus of opinion that a policy of waiting and seeing is in order. If the F.D.A. approves the use of a substantial portion of the flavor materials as being drawn up and revised by the F.E.M.A. at the present time, the manufacturers may take heart and try to introduce some new materials for flavor use. The difficulties to be encountered in the future in introducing new flavomatics can be guessed at, until we see how this whole matter of flavors is going to be handled by the F.D.A.

I hope you will pardon my seeming digression from the subject at hand but I felt that an expression of our feelings in this matter was rather pertinent at this moment.

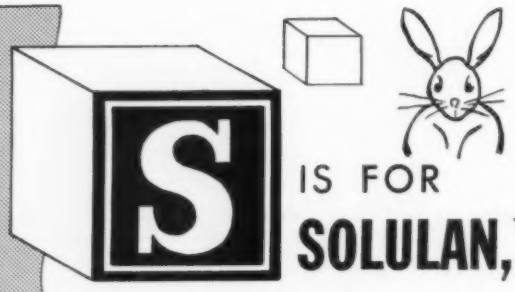
There are some new flavomatics which have been made available within the recent past and have been used before the so-called deadline of January 1, 1958 (as set up in the law) and which should appear in the listing of the F.B.M.A. flavor materials to be submitted to the F.D.A. in the near future.

One of these materials is allyl ionone which has a rather aromatic pineapple odor and could be used to a certain extent to give this pineapple *odor* to flavors if allyl caproate should become taboo for flavor use, a not unlikely possibility.

Since I am not a flavor man I cannot vouch for its taste but I have been assured that pineapple taste can be achieved without allyl esters, most of which are likely to be banned for human consumption. It seems that allyl isothiocyanate may be one of the few allyl esters to remain on the approved list. We have had sub-acute oral toxicity studies made on allyl ionone and are pleased to report no deleterious effects at 100 times normal usage. The use of this material seems to smooth down the flavor compositions in which it is used.

Another new material which was introduced as glycidate M-116 can now be revealed under its true name of methyl 3-4 dimethyl 2-3 epoxy-4 hexenoate. This material could prove itself invaluable in berry flavors, particularly in strawberry. It also has the peculiar property of intensifying other flavors when used in relatively

*Trubek Laboratories, East Rutherford, N. J.



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minute amounts, and without asserting its own characteristic odor and taste.

This material has a richer and fuller odor and taste than the socalled aldehyde C16, or ethyl methyl phenyl glycidate, for which it may be substituted in some formulae, using substantially smaller amounts for the same effects. In candies it seems to import a note reminiscent of palatone. The toxicity studies were made on this material and were completely satisfactory in every respect.

Alpha methyl cinnamic aldehyde which is relatively new has also found rather interesting flavomatic uses.

It may be substituted in whole or in part for cinnamic aldehyde which it resembles basically, differing only with respect to its trueness to cassia oil. The alpha methyl cinnamic aldehyde is much closer to the true cassia note. While more expensive than cinnamic aldehyde it deserves consideration for giving a flavor a more subtle note and a noticeable variation from the stock cinnamon.

The toxicity studies of this material have been made and found satisfactory in every way.

As a take-off from the alpha methyl cinnamic aldehyde we also might consider its reduction product, the alcohol, beta methyl cinnamic alcohol, which could be substituted for cinnamic alcohol, for its more tenacious balsamic qualities. Beta mehyl cinnamic alcohol has roughly twice the strength of ordinary cinnamic alcohol.

While no toxicological data is available at the present time, on this material it would be safe to assume that its metabolic degradation within the body would be the same as that for its corresponding aldehyde which has been found to be safe.

Methoxy phenyl butanone is another new material for use as a flavomatic and aromatic. This material should blend well with most fruit compositions which it will tend to sweeten and tie together as a more pleasing homogeneous entity. It possesses an intense fruity odor which in itself has proven very interesting to a number of flavor people. As to its specific uses, you gentlemen are the experts, I can only offer it for your consideration, with each of you probably conceiving a different end use for it.

Another interesting group of compounds with good potential flavomatic uses are the various esters of cyclohexyl acetic acid. They impart the same honey-like notes as the phenylacetic esters without running the risk of that "horsy" odor which may appear when the phenylacetic esters hydrolize in finished compositions. By personal observation, I have found isobutyl cyclohexyl acetate to be very interesting indeed. This is just a thought which you might consider some time when you find some phenylacetate unsatisfactory because of its bynotes.

Since the prospects of new flavomatics in the near future appear rather dim, the most realistic approach might be to begin a re-evaluation of approved natural materials, and to set up research programs to delve further into the composition of the materials we have more or less taken for granted in the past.

I am certain that a wealth of constituents could be identified from these oils and flavors and since they are part and parcel of approved materials, they in themselves could constitute an entirely new field of flavomatics.

By proper use and blending of these materials, synthetically produced when once identified, a wealth of new and improved flavors could result. If this program were carried out by the proper teams of research men and flavor men working as a unit toward common goals, I do not doubt that this could usher in a new era for a very old industry.

INDUSTRIAL SOAPS: WHAT CAN BE DONE WITH SOAPS TO MEET THE CHALLENGE OF DETERGENTS

WARNER M. LINFIELD
Soap Division Armour and Company

In the past decade the industrial use of soap has declined to such an extent it might appear as if soap would soon be an obscure chemical, a laboratory curiosity. Needless to say, soap has some obvious shortcomings both in industrial and household applications. Presumably the dramatic rise of the synthetic detergents is at least in part due to some of these shortcomings.

The most obvious shortcoming of soap is familiar to everyone, namely, the precipitation of calcium and magnesium soaps by hard water. A second drawback, particularly in high-titer soap, is its low solubility in water. In view of the steadily declining industrial soap market, changes obviously have to be made to meet the challenge of the synthetic detergents. As I see it, there are four methods of approach to be used individually or jointly. The first of these is the incorporation of additives to eliminate the precipitation of calcium and magnesium soaps at least in moderately hard water. The second step would be to blend soaps with an appropriate synthetic detergent. A third possibility would be the use of special additives which would give the soap a uniqueness that cannot always be achieved with synthetic detergents. The fourth step, which is perhaps the most important one, is one of education.

Before going further into the details of how to reformulate and blend soap, I would like to emphasize strongly the educational phase mentioned above. Excellent promotional material prepared by many producers of synthetic detergents has made the industrial user well aware of the advantages of synthetic detergents, whereas soap is made to appear old-fashioned, and good technical information about the industrial use of soap is obsolete. The major portion of this talk, therefore, will be devoted to extolling the virtues of soap and to point out its uniqueness.

Let me begin with the biological properties of soap. Safety to humans is perhaps soap's greatest virtue. It has a clean "clinical" bill of health that is as old as civilization. Soap is referred to in the Bible in the Book of Malachi, Chapter III, verse ii. Lest some Bible scholar argue the point, I should point, out however, that in the original Hebrew, reference is made to lye rather than to soap. To sum it up, soap is the least irritating to the skin and the least toxic of all surface active agents. Since soaps are products derivable from normal humans and animals metabolism, this is not too surprising. The safety of soap extends into the microbiological world. Soap is the only surfactant that will not cause stream pollution and one which will not upset sewage disposal plants.

Another interesting aspect of soap of a biological nature is its effect upon certain antibacterial agents. Even though this is of benefit primarily in the household and hospital fields, I would like to mention nevertheless that certain antibacterial agents, such as hexachlorophene, bithionol, and trichlorocarbanilide, are most effective on the human skin when applied from a soap medium. Considerably higher concentrations of the same agents are needed to attain the same antibacterial and deodorant activity from a synthetic detergent medium. It should be mentioned just in passing that this analogy does not hold in treatment of fabric.

The chemical properties of soap are well enough known, particularly precipitation by polyvalent metal ions. This aspect of soap is in some respects its greatest weakness, yet in areas of relatively low water hardness, it is difficult to account for the rapid shift to synthetic detergents. I am speaking here primarily of the textile industry, which is located essentially in Piedmont and coastal areas of the South and New England, both of which are soft water areas. This is an industry which could use soap to advantage. Nevertheless the use of soap chips and powders has given way to aqueous solutions of detergents. Thus the modern textile industry is confronted with a bewildering array of proprietary synthetic detergent mixtures containing as a rule a generous portion of water. Naturally, because of the limited solubility of soap, soap producers cannot indulge in similar operations involving the sale of water. The textile maintenance industry, which has used water softeners for many years, likewise has little justification in switching from soap to synthetics, and for this reason the laundry industry by-and-large has remained loyal to soap.

The calcium, lithium, and other metal soaps have of course found industrial use as grease and lubricant compounds. Furthermore the ease of precipitation of soap with polyvalent metal ions is used to advantage in the treatment of industrial waste water where alum is used as a precipitant.

A second important chemical property of soap is its ease of precipitation by strong acids. This chemical reaction is useful whenever it is desired to eliminate the surface reaction activity of soap. This principle was commonly used in the scouring of raw wool where the scoured waste was acidification and the raw wool grease recovered. This technique, however, has also been replaced in part by the use of nonionic detergents in place of soap and subsequent centrifuge treatment. Furthermore, the precipitation of soap by acid is useful in sewage treatment.

Let us consider next the physical properties of soap. In the realm of detergency of cellulosic fiber, it is hard to beat the performance of soap. Unlike synthetic detergents, soap does not need soil-suspending agents such as CMC, it does not need foam stabilizers like the alkylolamides, and it does not require the hard-water conditioning of the poly-phosphates. It is therefore not too surprising that laundries in this country have continued to use soap. In addition to its excellent detergency, soap also imparts lubricity and softness to fabric to an extent unmatched by any synthetic detergent. Curiously enough this aspect of the use of soap has escaped the attention of the textile industry, which is now using fabric softeners for almost all finished fabric. The lubricity of soap is utilized in many industries where de-

tergency is of no great importance, as for example, in wire drawing, in chain lubrication in bottling plants, and in the textile industry in the fulling of wool. It is also used in cosmetics, in plaster, and cement, and as an emulsifying agent in the polymerization of rubber.

I believe that an educational campaign on behalf of soap is perhaps the best way of meeting the challenge of the syndets, especially as municipalities acquire water-softening plants. As more and more industries acquire water-softening equipment, the use of synthetic detergents appears less desirable. In this connection it is interesting to note how the average water hardness has been reduced in certain areas due to the installation of municipal water softening plants. For example compare the water hardness prevailing in 1932 with those of 1952 in just a few cities.

	1932	1952	
Albany, New York	68	47	p.p.m. $CaCo_3$
Schenectady, New York	193	160	
Springfield, Illinois	150	94	
Wichita, Kansas	130	86	
Topeka, Kansas	170	100	
Elizabeth, New Jersey	212	61	
Washington, Pa.	169	67	
Corpus Christi, Texas	184	135	
Madison, Wis. over	400	300	

On the whole it appears that the smaller cities which are using well water of great hardness have been most active in water softening in an effort to bring their water hardness at least to that of the nearest big city. Thus in the period between 1932 and 1952 the statewise average hardness of New York and Arkansas has dropped from medium hardness range of 61-120 ppm calcium carbonate to the soft water range of 0-60 ppm, likewise Illinois, North Dakota and Kansas have switched from the high hardness range of 121-180 ppm into the medium range of 61-120 ppm.

Another important aspect in this picture is economics, of course, it is interesting to note that whenever the price of soap drops below that of commonly known low-cost synthetics, the volume of industrial soap consumed appears to increase. If the price of soap goes up, the decrease is just as noticeable. This gain indicates that the industrial user is not too well informed as to the advantages and properties of soap, otherwise he would not be inclined to switch back and forth and buy on a price basis only.

Coming back now to some of the alternates which I mentioned initially, I am not going to recommend definite formulations here but I would like to indicate that, for example, through the judicious use of an appropriate sequestering agent, soap can be used as an efficient detergent. For example, a blend of equal solids content of soap and sequestering agent of the ethylene diamine tetraacetic acid plus some alkaline builders gives excellent detergency in water of a hardness of 50 ppm and is quite comparable in performance falls off somewhat, and in 300 ppm water the performance of the soap E. D. T. A. mixture is quite poor.

Obviously other sequestering agents would behave similarly and would remain effective up to the point where they can no longer complex all of the calcium and magnesium ions present in the wash water. However, unfortunately chelating of the calcium and magnesium ions is not the complete answer to the use of soap in moderately hard water. In a laundering operation it may be possible to tie up calcium and magnesium in the wash cycle but in the subsequent rinses there occurs an infinite dilution with hard water and the lime and magnesium soaps would thus be precipitated. This undesirable reaction can be overcome by the incorporation of synthetic detergents.

Many synthetic detergents possess the ability to disperse calcium and magnesium soaps in water. Thus instead of the usual hard-water scum there is produced a finely divided colloidal precipitate of the hard-water soaps uniformly dispersed in water. Thus the detergents do not act as sequestering agents but as dispersing agents and protective colloids. Not all detergents are equally efficient in their lime soap dispersing efficiency. The non-ionic detergents such as the nonylphenol or octylphenol ethylene oxide adducts are extremely efficient so that the addition of 15 per cent of nonionic to the solid soap generally suffices to produce lime soap dispersion upon infinite dilution with hard water. The ionic detergents vary greatly in the dispersing effectiveness. The straight chain compounds (i.e. fatty acid derivatives) are generally more effective than the branched chain compounds (petroleum derivatives). The presence of nitrogen in the molecule enhances the dispersing power. Thus the dodecylbenzene sulfonates, which are the biggest competitors of soap in the industrial field, are least effective in dispersing hard-water soap in a soap-syndet mixture. The fatty alcohol sulfates in turn are less effective than the fatty amide derivatives.

In conclusion, I would like to state that it is thus entirely possible to produce a blend of soap, synthetic detergent and sequestering agent which is economical and effective in performance in all low to medium hardness areas. In fact such a blend in many ways represents a happy union of the best properties of both soap and detergents, combining the lubricity and softness imparted to fabric, and soil-suspending power of soap with the ready solubility in water and lime soap dispersing power of the detergent.

It is entirely conceivable that ultimately such a blend will become the standard for the industry, and thus the future for industrial and institutional soap may be a fairly bright one if the users of surfactants become reacquainted with the advantages and uniqueness of soap. Above all the public should be made aware of the fact that the latest thing on the market is not necessarily the best, and fundamentally the soap which our grandmothers used to boil on the kitchen stove perhaps was not such a bad detergent after all.

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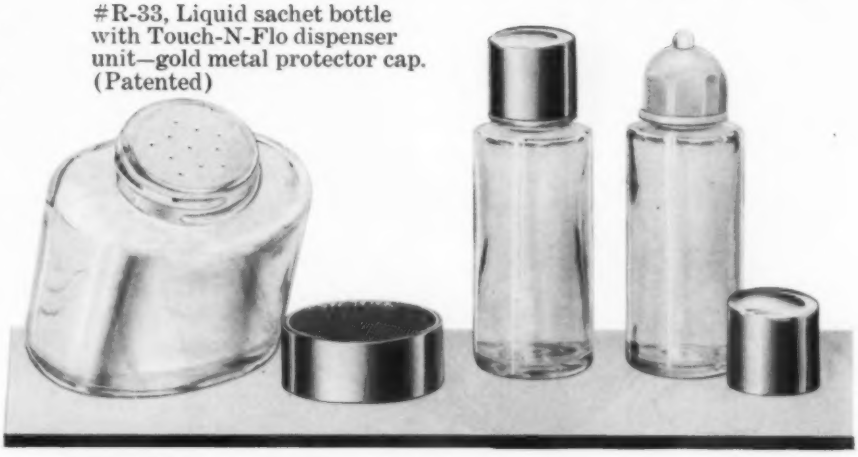

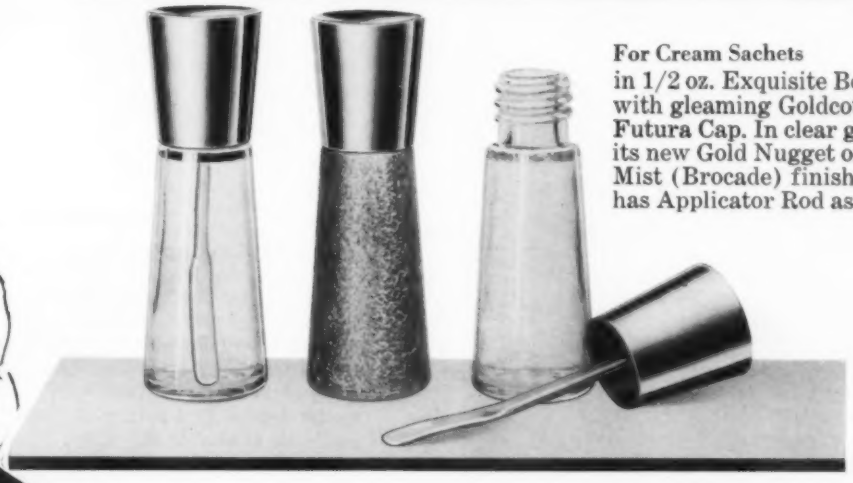

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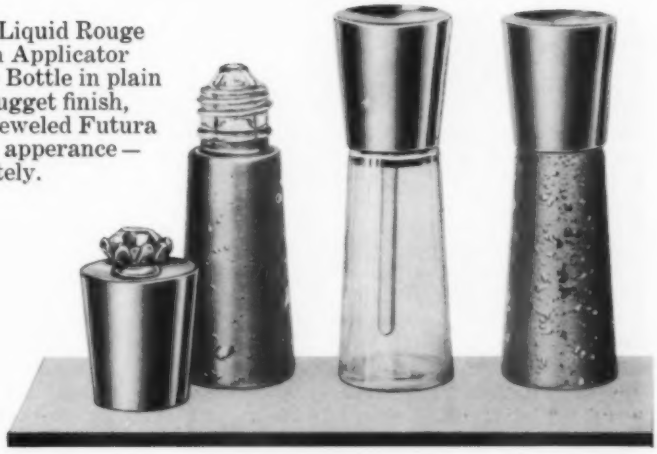

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1.

BOURJOIS—1

Bourjois has announced the return on its popular yearly promotion, the Evening in Paris "Double Take." The aura of a Parisian boulevard has been captured in the packaging, with an awning of blue and white over Evening in Paris Talcum Powder and Eau de Toilette. At the bottom of the package are French street scenes, etched in various hues of blue. As a final Parisian touch, the kiosk in the center serves as a perforated price tag. "Double Take" will again be available for $1.00.

2.

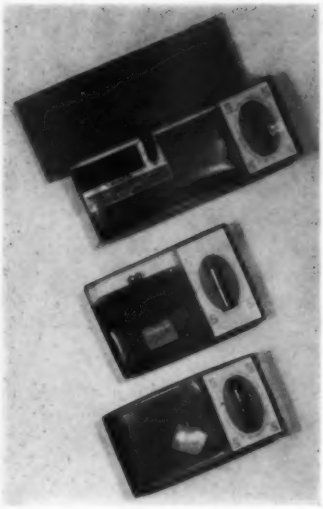
SHULTON—2

A compact, self-service counter merchandiser, containing the top-selling Old Spice products, has been designed by Shulton, Inc. The 24 units, in proportion to their rate of sale, include After Shave Lotion, Cologne, Pre-Electric Shave Lotion, regular and mentholated Smooth Shave, and Spray and Stick Deodorants. The new merchandiser takes less than two square feet of counter space. It is sturdily constructed of heavy duty wire.

TINKERBELL—3

Tinkerbell Toiletries is now featuring Pink 'n' Pretty lipstick as an individual toiletry packaged in pastel-colored plastic cases. According to the manufacturer, Pink 'n' Pretty lipstick imparts a light shade of pink that does not stain the lips permanently, and can be easily removed with tissue. It is also reported to provide protection from the dryness of the summer sun.

3.



4.

5.

SCHIAPARELLI—4

Schiaparelli has introduced a gift set which includes a flacon of perfume and a choice of a cowhide billfold, French purse or continental. They are designed to compliment the handbag as a high fashion accessory. Colors are red, black, antique white, and turquois. They will be priced at around three dollars.

HELENE PESSL—5

"Little Lady" has designed a special promotional item to retail at $1.00. It contains three of the most popular of the Little Lady items—hand lotion, toilet water and rose mint cologne. They are packaged in an acetate see through container permitting automatic self-display.

6.

MAX FACTOR—6

Max Factor's new lipstick line, Iridescent Magic, is scheduled for general distribution in May. This unique counter display features five iridescent shades, together with a new kind of white pearlescent lipstick and a gold iridescent lipstick. The "Essence of Pearl" and "Golden Frost" lipsticks can be worn over or under any other shade to achieve an iridescent effect. In addition to the lipsticks, the counter display features a tester for each shade. National advertising is scheduled to break on May 3.

7.

CHRISTIAN DIOR—7

Christian Dior's latest perfume, Diorissimo, now appears in an Eau de Toilette version. It will be introduced in the "Traveler" presentation only, in four sizes. The flacon has a black and white houndstooth cap design matched by a wide band at the base. Around the neck of the bottle is a white satin bow. The screw cap and oval shape make this bottle particularly suitable for travel. It will be introduced in time for Mother's Day promotion.

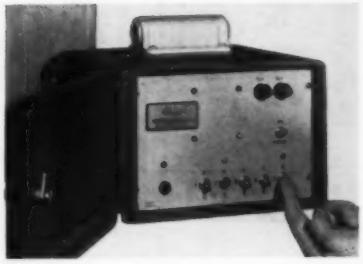
New PRODUCTS & IDEAS

REGULATOR JACKET

Jacketed regulators are now available from OPW-Jordan. The Sliding Gate Regulators with Thermon Jackets are used to solve industrial heat transfer problems associated with viscose or hard to handle fluids. The jacketing surrounds steam tracing lines and keeps fluids from hardening or solidifying. According to the manufacturer they are more efficient than conventional tracing and less expensive than steam jacketing. They will reportedly work equally well for heating or cooling applications and are easily removed for access to the regulator.

CENTRIFUGE—1

Westfalia now offers a new, high capacity centrifuge specifically designed to solve the problem of continuous liquid clarification, continuous three-phase separation, and continuous recovery of valuable solids or liquids. The SAMN-15007 Westfalia Automatic De-Sludger has achieved capacities of 6000 gph with good efficiency, according to the firm. Distributed by Centrico Inc., the machine is finding widespread use for clarification, separation and recovery. By means of a stationary built-in centripetal pump, the liquid phase (or phases, in the case of a separation) is discharged under pressure and foam-free. All metal parts in contact with the process stream are stainless steel. Powered by a vertically mounted, 40-hp motor, the SAMN-15007 uses no clutch or gears. Power is transmitted to the drive shaft by special high-speed V-belts.

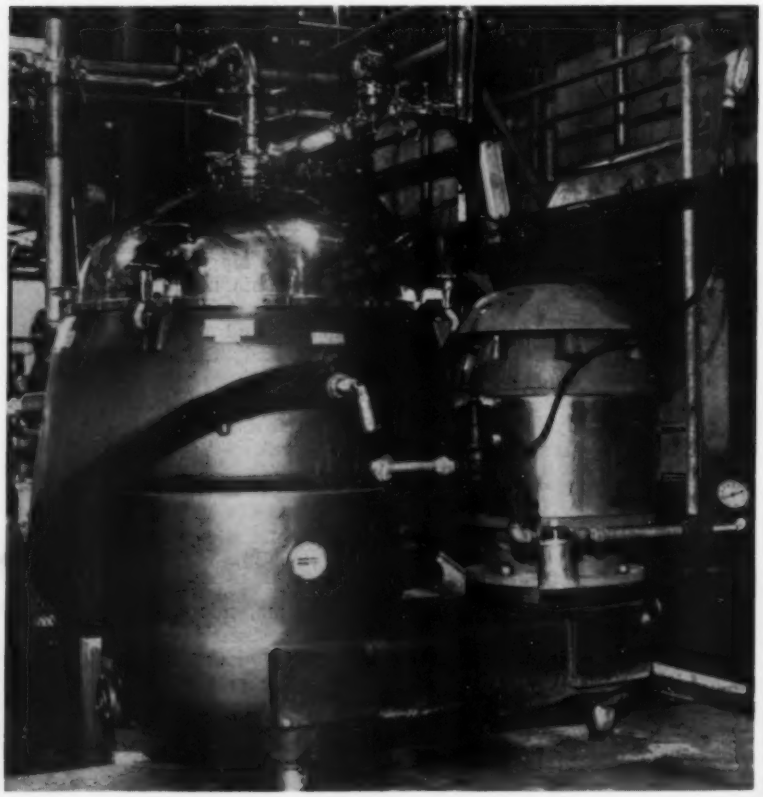


2.

CARTON SELECTOR—2

Automatic case selection is now possible with the new Model 410 Carton Selector from Atronic Products, Inc. Selection on any type case, box, or carton regardless of size or shape is by means of a 5-bar code. Any one of 30 different items may be counted and sorted by the device as the goods move along a conveyor or similar material flow line. Up to 30 different items may be separately coded with the 5 vertical bars. The selector switches may then be set to recognize any one of the markings as the cartons pass at speeds up to 180 feet per minute, according to the manufacturer. The Carton Selector also provides an output signal that can be used as needed, for example to activate a conveyor switch and so automatically control the flow of goods and sort them for further processing, etc.

1.



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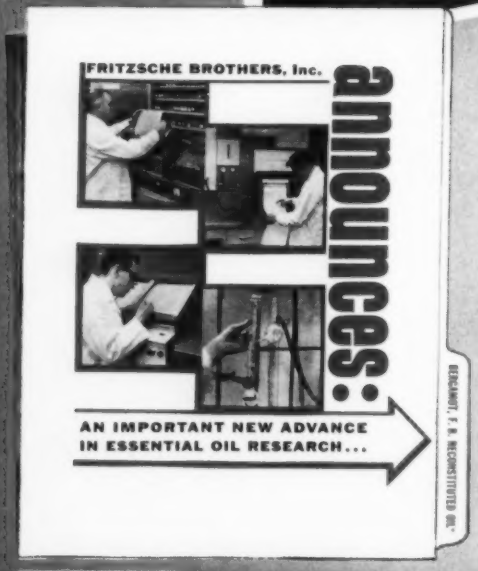

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Lipsticks

(continued from page 49)

which was originally attached to the main part of the skin.

Pictures 15 and 16 represent the same skin segment taken from above and below but at 130 times magnification. This magnification brings out still more clearly the number and size of the stained spots. The right upper edge of picture 15 shows a strongly stained section. This is apparently a part of the skin segment which, as already mentioned, extended freely over the crack of the skin. Naturally, this part of the segment which was completely detached from skin below could be stained from both sides.

In order to show the structure and stain of the skin at higher magnification, top illumination had to be abandoned since it would not give enough light for photographic work. The pictures which represent higher than 130 times magnification are all taken with transmitted light. Pictures 17 and 18 are photomicrographs of the edge of the segment shown in Pictures 13, 14, 15 and 16. The magnification is 500 times. In these two photomicrographs, two different skin areas are depicted. One can notice that continued microscopic solution still shows a heterogeneous staining of the skin although the stained spots have a relatively uniform coloration overall.

Picture 19 shows the unstained edge of the skin segment. At this rather large magnification it is obvious that this part of the skin segment is actually unstained.

All these observations show that the stain of the lips by the lipstick is located only on the outermost layers of the stratum corneum. The so-called bromo acids do not penetrate beyond the stratum disjunction. This was also verified by histological tests on animal skin. But for the final answer to the question are the "bromo acids" irritants in "kiss proof" lipsticks it is obvious that more work has to be done. This study shows one approach to the problem.

Summary

The present investigations show that the living human skin of the lip is not stained uniformly by the so-called "kiss-proof" lipstick.

Only certain regions of the skin surface are stained. Essentially, the lipstick mass which has just been applied covers the high spots of the skin. After wiping the lipstick mass off, the high spots are relatively free of lipstick mass and the remaining mass now lodges in the furrows and cracks of the lips.

In spite of continued use the skin of the lips cannot be stained uniformly. To the naked eye, the uniformity of the stain is only apparent because the human eye is unable to dissolve optically the discontinuity of the fine raster of the stain.

The penetration of the stain into the skin according to the present observation amounts to only two-fifths of the thickness of the stratum corneum. Therefore, it does not even come close to the so-called living regions of the epidermis.

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Flavor Materials

(continued from page 46)

The enormous potential of this analytical technique is fully realizable only when the effect of all these variables is fully understood. The operating temperature of the column must, of course, be extremely constant but in addition must be neither too high, which could cause in addition to decomposition also a crowding of the fractions being eluted, nor too low which would at least slow up the separation and at worst might result in some of the less volatile fractions being lost in the column and never being eluted. The temperature at the head of the column must be in proper relationship to that at the rest of the column and to that in the detector. If it is too high, it will cause decomposition; if too low, improper volatilization with loss of resolution and other detrimental effects.

The support phase must be of precisely the right density and fineness. Too coarse a powder would cause loss of resolution; too fine, blocking of the gas stream. The stationary phase, as well as the support phase, must be carefully prepared to prevent acidic isomerizations and dehydrations and, of course, the choice of the stationary phase will influence the degree of separation due to the partitioning factor of the components of the unknown between the stationary phase and the vapor phase.

Detector, length of column, type of material for column construction, and numerous other factors determine the effectiveness of the results achievable and, of course, many different kinds of columns are required for the various separations which are desired.

The above variables have been studied mainly in analytical size columns of approximately ¼ inch diameter. When it is desired to prepare working samples of separated components, a wider bore column is required and the complexity of the problems is greatly increased. Nevertheless, it has been possible to separate as many as thirty components of a mixture; for example, that of strawberry oil and of a number of other naturally occurring flavor and fragrance materials. These components can be studied subjectively by smell and taste, and identified in many cases once they have been obtained in a relatively pure state by such examination. Supplemental methods of spectral examination are now much more valuable for identification purposes than the same techniques when applied to the mixtures and the isolable quantities, even of trace components, are large enough for such examination.

More recently, another type of spectral analysis, namely, nuclear magnetic resonance spectroscopy has been utilized for the examination of a limited number of materials in the fragrance field. This technique adds another decimal point to the amount of information which can be obtained as to the constitution of these materials, but the technique is still too young to have found widespread application.

More esoteric instrumental methods such as x-ray diffraction, particularly in the case of solids, and mass spectroscopy may have application in isolated cases but in general do not compare with the previously mentioned techniques in all around usefulness. Together with Raman and near infrared spectroscopy, they seem to have limited scope in the light of present knowledge.

A brief summary such as the present can serve only to introduce the subject of instrumental analysis and hint at the scope of its applicability. To those interested in utilizing any of these methods for analytical purposes in the flavor field, much literature and other information is available, but the true usefulness will develop only after considerable firsthand experience in the field.

A summary of the lecture given by F. Sorm of the Institute of Chemistry, Czechoslovak Academy of Science, Prague, Czechoslovakia, on April 13th before Wayne State University's spring "Frontiers in Chemistry" lecture series, in Detroit.

The Chemistry of Pro-Azulenes and Sesquiterpenic Lactones of New Types

F. SORM*

Chamazulene, the deep-blue component of the oil of chamomile, has been attracting the attention of chemists for many decades but its structure has remained unknown until fairly recently. It was only when the discovery of the so-called chamazulenogen, the fulvenic hydrocarbon $C_{14}H_{18}$ from wormwood oil, stimulated a systematic study of the precursors of chamazulene that its structure as 1,4-dimethyl-7-ethylazulene was established.

The application of modern partition methods made possible the isolation of the true precursors of chamazulene[3]—matricin (I) and artabsin (II)—from chamomile flowers and wormwood, respectively. These compounds were shown to be guaianolides, a group of compounds closely related to the santanolides. Further work has revealed the structure of these two compounds which under relatively mild conditions undergo far-reaching decomposition to give rise to chamazulene or chamazulenogen, the latter on dehydrogenation also giving chamazulene.

Absinthin (III), the bitter principle of wormwood, which has formerly been assigned an incorrect formula has now been shown to be a guaianolide, $C_{30}H_{40}O_6$. Again, it readily passes into chamazulenogen and chamazulene. It could further be shown that absinthin is the product of dimerisation—through the cyclopentadienyl moieties—of two guainaolide units (isomeric with artabsin). All these compounds readily pass into chamazulene on mild acid hydrolysis and hence are the true chamazulene precursors in the essential oils. The formation of chamazulene in the working up of plant material has thus been fully clarified. The occurence of 2-methyl and 2-ethylchamazulene together with chamazulene in wormwood oil has also been explained; these azulenes are formed by the reaction of formaldehyde or acetyldehyde with artabsin.

The isolation of artabsin and matricin from plant material acted as a stimulus for further research on lactones from Compositae. In the course of this work it was found that a large number of previously known compounds are guaianolides (dehydrocostuslactone, absinthin, anabsinthin, carpesialactone, helenalin, tenulin, ambrosin, geigerin and lactucin). In addition, several new lactones were found in Compositae (e.g. arborescin, matricin). The greater part of these are also guaianolides, the frequent occurrence of which in Compositae has thus been established. However, none of these lactones are true precursors of chamazulene, rather drastic conditions being required for their conversion into the azulene.

Some of the above lactones, particularly arctiopicrin (III) and pyrethrosin (IV), are not guaianolides. Both contain ten-membered rings and their structures seem to throw light on possible biogenetic pathways of the santanolides and guaianolides and possibly some other cyclic sesquiterpenes. This is well illustrated by the ready conversion of arctiopicrin into the santonin derivative V.

Lactones of the guaianolide type appear to undergo further oxidation in plant material, as witnessed by the structures of lactucin (V) and of xanthinin (VI) in which fission of the five-membered ring has taken place, as well as by some preliminary results on the so-called yellow lactones from wormwood.

Some biogenetic relationships concerning lactones of different types have also been established. Rotational dispersion measurements have shown that the five-membered rings in helenalin, tenulin and ambrosin possess the same stereo-chemistry. Santonin, photo-santonin and arctiopicrin on the one hand and artabsin and absinthin on the other have been shown to possess the same absolute configurations on the carbon atoms 6 and 11 by comparison of the lactone dicarboxylic and tricarboxylic acids formed on nitric acid oxidation of the lactones.

*Institute of Chemistry, Czechoslovak Academy of Science, Prague, Czechoslovakia

News and Events

Dr. Irvin H. Blank To Receive Society Of Cosmetic Chemists Special Award For 1959

The Special Award presented annually by the Society of Cosmetic Chemists, and carrying a prize of $1000, will be awarded this year to Dr. Irvin H. Blank in recognition of his fundamental research and writings on Factors Controlling Suppleness and Flexibility of Skin. The distinguished dermatologist and biochemist will attend the May 7th Meeting of the Society at the Hotel Commodore to receive the award.

Dr. Blank was among the first to recognize, demonstrate and publicize the fact that moisture is the primary factor in keeping skin soft, smooth, and supple. His simple and conclusive experiments proved that the keratinized layer of the skin becomes hard and inflexible when dehydrated and cannot be softened by oil or humectants. Instead, water alone is necessary and sufficient to restore softness and flexibility of the skin.

According to the Society's Special Award Committee which reviewed many recent publications in the fields related to cosmetic science, Blank's basic discovery has been amplified by more recent work on the effects of surfactants on moisture-retaining powers of the skin, on the desirable features of cosmetic creams, on the mode of penetration of substances applied to the skin, and on the location of the skin's barrier layer.

Dr. Blank completed his undergraduate work at the University of Cincinnati in chemical engineering, and received graduate training in bacteriology and biochemistry in the Department of Leather Research at the same University. In 1934, he began the study of human dermatophytes at the Harvard Biological Laboratories and joined the Harvard Medical School in 1936. He is now an Associate in Dermatology at the Harvard Medical School and Associate Biochemist at the Massachusetts General Hospital.

Dr. Blank has conducted research into the action of soaps and synthetic detergents on the skin; the control of the bacterial flora of the cutaneous surface; the action of aluminum salts as antiperspirants and deodorants; and the mechanisms of action of topically applied therapeutic agents. He is the co-author of a monograph entitled "A Formulary for External Therapy of the Skin" in which work conducted on topical therapeutic agents is discussed.

Dr. Blank is a Fellow in the American Association for the Advancement of Science and was awarded the CIBS award in 1956 for a paper presented at the Scientific Section of the Toilet Goods Association in 1955. He is also a member of the A.M.A. Committee on Cosmetics.

The Spring meeting of the Society of Cosmetic Chemists at which the Annual award will be presented will feature papers on a variety of scientific subjects related to cosmetics. Papers will be on Enzyme Chemistry, Tissue Culture Studies, Measurement of Skin Moisture and Degerming Activity of Toilet Soaps.

Dermatologicals Cited as Next Important Aerosol Advance

Dermatological pharmaceuticals and medicinals represent the latest major aerosol advance, according to H. R. Shepherd, president of Aerosol Techniques, Inc. Demonstrating the conviction that push-button foam and spray preparations offer important market potential, ATI is now devoting a substantial part of its laboratory activity to dermatologicals, with Dr. Norman Orentreich aiding in clinical evaluation and consultation.

Precision Valve Offers Licensing Agreement

The Colgate-Palmolive Co. has entered into a licensing agreement with Precision Valve Corp. of Yonker, New York, permitting Colgate to package, under Precision's pendnig patent application, a pressure dispensed tooth paste in an aerosol container. Precision is offering similar royalty-free licensing agreements to all companies marketing aerosol dentifrices.

Alpine Aromatics In New Plant

Alpine Aromatics, Inc. recently moved into its new plant at the Edison Industrial Center, Metuchen, N . J. The building includes facilities for perfume compounding and chemical manufacturing.

DR. ERNEST GUENTHER ADDRESSES CALIFORNIA S.C.C.

At the regular monthly meeting of the Society of Cosmetic Chemists, California Chapter, February 23, Dr. Ernest Guenther presented one of his excellent dissertations on the source of supply of the important perfume oils. In the picture from left to right are Benjamin Kapp, Paul W. Jewel, "Pete" Clapp, Emory Smith, Chairman, Dr. Guenther, Stanley Crouch, West Coast Representative for Fritzsche Bros., Howard Mace and David Lozano.

CARMEL MYERS PRESS PARTY

Among members of the Press attending Carmel Myers Pre-Easter Party for her perfumes—Zizanie and Gamin: Irma Torem, *Charm;* Grace Hoffner, Fawcett; Karlys Daily and Joan Carter, *Glamour;* Carmel Myers, hostess; Miriam G. French, *McCall's.*

Breck TV Series Cited By Radio-TV Editors

Shirley Temple's Storybook, sponsored by John H. Breck, Inc., was recently named the "Children's Show of the Year" by the nation's Radio and TV Critics. In naming the "Shirley Temple's Storybook" program as tops in the category, the editors and critics described the show as a runaway favorite. The show was selected among the first five "Best Filmed Series" on Television and Miss Temple was also selected second among the first five "Women of the Year" on radio and television.

Du Pont Reports 1958 Sales Off 7%

Sales of the Du Pont Co. were $1,829 million in 1958, off seven per cent from 1957, but in the final three months set a record high for any quarter in the company's history, it was disclosed recently by Crawford H. Greenewalt, president, in his annual report to the more than 209,000 stockholders. Earnings, as announced earlier by the company, were $7.25 per share of common stock, including $2.54 from General Motors dividends. In 1957 earnings were $8.48 including $2.55 from General Motors.

Lee W. Kohnstamm Joins V. & H. Kohnstamm, Inc.

V. & H. Kohnstamm, Inc., manufacturer of flavors and extracts for the soft drink industry, announces that Lee W. Kohnstamm, son of President E. J. Kohnstamm, has joined the company as Sales Representative. Lee is a graduate of the Wharton School of Finance and Commerce of the University of Pennsylvania and prepared for his present position by going through an intensive training program during his summer vacations.

Drug, Chemical, Allied Trades Forms Advisory Committee

Ralph A. Clark, president of the Drug, Chemical and Allied Trades Section of the New York Board of Trade, recently announced the formation of an advisory committee to serve the 350 non-resident members of the trade organization.

Toilet Goods Assn. Scientific Section Program

Allantoin and the Newer Aluminum Allantoinates, by S. B. Mecca, chemical director, Schuylkill Chemical Co.

A Quantitative Clinical Method for Comparing Antidandruff Agents, by Herbert J. Spoor, M.D., Ph.D., Department of Medicine (Dermatology) New York Hospital and the Cornell University College of Medicine.

About the Mechanism of Moisture Regulation in the Horny Layers of the Skin, by O. Jacobi, Ph.D., Kolmar Research Center.

Inhalation Toxicity Studies of Six Types of Aerosol Hair Sprays, by John H. Draize, Ph.D., Arthur C. Nelson, M.D., Ph.D., Sylvan H. Newburger, Ph.D., and Elsie A. Kelley, B.S. Dr. Newburger is in the Division of Cosmetics, the others in the Division of Pharmacolgoy, Bureau of Biological and Physical Sciences, Food and Drug Administration, Department of Health, Education and Welfare.

Olfaction and Cholinesterase, by Paul G. I. Lauffer, director of research, Northam Warren Corp.

A Study of the Curling Action of Water, Hair Sprays and Waving Lotions, by E .J. Stravrakas, Fabric Research Laboratories.

In vitro and Use Tests for the Evaluation of Degerming Agents, by Harry L. Rubenkoenig and Paul A. Majors, Hill Top Research Institute, Inc.

Moisture Determination by Means of Radio Frequency Power Absorption, by Patricia Miller and John Jones, Bristol-Myers Co., and Boonton Polytechnic Co., respecitvely. To be read by title and published in the Proceedings.

Radioisotopes in Cosmetic Research Explained by Nelson

Dr. Manno F. Nelson, supervisor of the Radiotracer Laboratory of the Atlas Powder Co. lectured before a large and appreciative audience of members of the New York Chapter of the Society of Cosmetic Chemists in the Hotel New Yorker on the evening of March 4. His topic was on the use of radioisotopes in detergent and cosmetic research.

He showed how the application of radioisotopes in modern detergent and cosmetic research has resulted in the development of useful methods for measuring detergency, substantivity and related effects and for evaluating formulation additives for specific physical properties. Other studies have demonstrated the metabolic fate of cosmetic formula ingredients.

Chairman Theodore Ostrowski presided with his usual skill.

Soap, Detergent Sales Set New Dollar Figure

Sales of soaps and synthetic detergents in 1958 registered the highest dollar figure recorded by the Association of American Soap & Glycerine Producers, Inc. in its twenty-three year history of sales tabulation. Sixty-seven manufacturers, representing a large segment of the industry, reported sales totalling $1,040,753,000, up 4.3% in comparison to 1957, which was also a record year. In terms of pounds of product, reported volume amounting to 4,089,500,000 pounds, remained close to the 1957 level.

Synthetic detergents, now constituting 72.2% of total sales reported, amounted to 2,951,352,000 pounds valued at $715,951,000, a 1.2% increase over 1957 in tonnage and a dollar rise of 4.7%. Liquid synthetic detergents, which have undergone dynamic sales expansion within the last few years, reached a new high: 1958 sales totalled 430,744,000 pounds, an 18.5% gain over 1957.

Soap sales for 1958 were reported at 1,138,148,000 pounds, down 4.3% from 1957. Dollarwise, sales totalled $324,802,000.

Scouring cleanser sales equalled 350,836,000 pounds with a value of $49,021,000. These figures are not included in the summary of soap and synthetic detergent sales discussed above. No comparisons are possible since this is the first year the Association has collected sales information on scouring cleansers.

MAX FACTOR WINS BUSINESS ACHIEVEMENT AWARD

As a tribute to its 50th anniversary, Max Factor & Co. received a special Business Achievement Award from the Los Angeles Chamber of Commerce in ceremonies at the Chamber's regular board of directors meeting. Max Factor, president of the firm, accepted the engraved silver plaque from Chamber President J. E. Fishburn, Jr. In making the presentation, Mr. Fishburn pointed out that this award is given only to firms with extended service to the business community. He congratulated the company on the completion of its new $3 million plant in Hawthorne, California and added that Max Factor holds the distinction of being one of the world's largest cosmetic manufacturers.

Mr. Carl Tylka, Director
Cooper Alloy Technical Service Dept.

What's your fluid handling problem? Vanton's Technical Service can help you solve it!

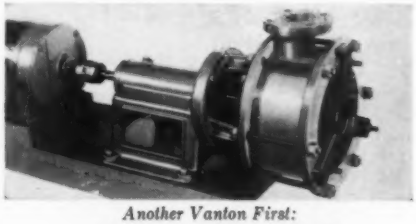
Whatever your pumping, valving, or piping problem—equipment specification, construction material, circuit design and layout—Vanton's fully competent, experienced Technical Service staff can be of help to you.

Headed by Mr. Carl Tylka, this new Cooper Alloy service has been set up to assist industry in solution of fluid handling equipment, design, and operational problems. It typifies Cooper Alloy's forward-looking approach to cooperation between user and supplier.

To set the ball rolling, just write to Carl Tylka, Technical Service director—and you'll get action!

Plastic Gate Valve now available with socket-weld and threaded ends

A complete line of Vanton socket-weld and threaded-end throttlable plastic gate valves is now available from Vanton in sizes from ½" to 2" in both PVC and Kralastic (U. S. Rubber Co.). What's more, you can have off-the-shelf delivery. The Vanton throttlable gate valve, first of its kind, offers the combined features of straight-through, no-pressure-drop flow with close throttling control. The combination of these two features of a gate and a globe valve makes these Vanton plastic valves the most versatile available. They are being used on the most severe services in the chemical, pharmaceutical, photographic, and other industries. Write for folder.



Another Vanton First:

All-PVC Centrifugal Pump!

Stops Corrosion, Avoids Contamination

Vanton Centrifugal Pumps are constructed with all wetted parts of unplasticized, unmodified polyvinyl chloride, offering the broadest possible range of chemical resistance as well as the non-contaminating transfer of sensitive solutions. Vanton PVC Centrifugal Pumps are generally lower in cost than special alloy pumps for similar applications. Pumps are available in a broad range of sizes: capacity 10 thru 180 GPM; discharge head to 100 ft.

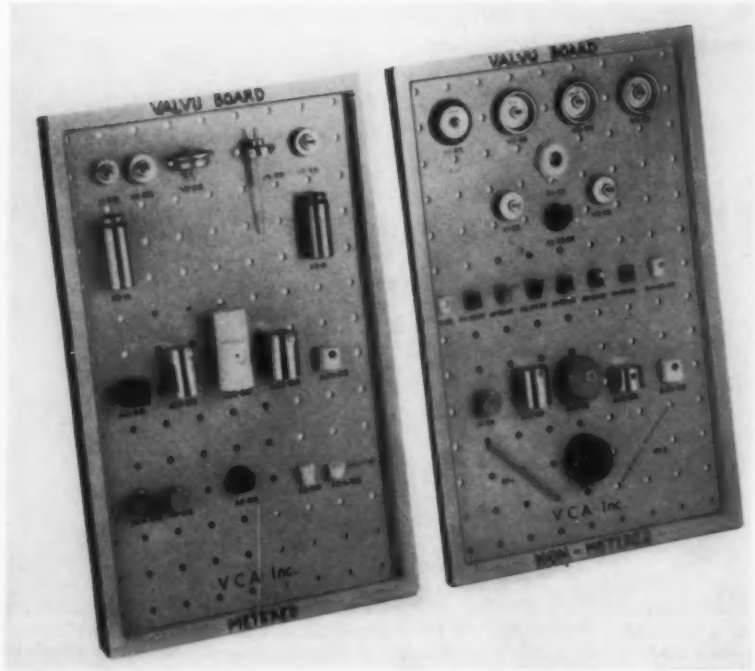
Casing: The heavy sectioned PVC casing is totally protected by a cast iron frame giving rigid support.

Impeller: The impellers are molded, and are of a dynamically balanced design. Vanes are contoured for maximum efficiency.

Bearing Pedestal: Low friction roller bearings are used for quiet operation and are widely spaced to reduce loading. A grease reservoir is provided to assure long bearing life. The heavy duty rugged bearing pedestal allows for rigidity of construction.

Mechanical Seal: Vanton PVC Centrifugals are equipped with mechanical shaft seals of the latest design. Seals are available in a range of materials to cover virtually all corrosive applications. Fluid contacts only facings of rotating and stationary rings. Rotating rings are available in DuPont Teflon or Carbon, and stationary rings in ceramic or Stellite. Stationary rings can be reversed for additional use after long periods of service.

For further information, write to Vanton Pump Division, Cooper Alloy Corporation, Hillside, N. J.



VCA Offers 3-D Aerosol Valve Catalog

A three-dimensional "Catalog" made up of actual working models of metered and non-metered valve components and assemblies, has been prepared for prospective packagers and manufacturers of aerosol products by Valve Corporation of America, Inc. The "Catalog" consists of two 11 x 14 inch Valvu view boards with mounted samples manufactured by the company. Each unit is identified with VCA price list numbers.

Owens-Illinois Plans New Orleans Plant

An ultra-modern, multi-furnace glass container plant will be erected on a 24-acre site on the Inner Harbor Industrial Canal in New Orleans, according to a recent announcement by Owens-Illinois Glass Co. The plant will occupy approximately 150,000 sq. feet on the 24 acre site. Features will include a fully automatic batch house in which raw materials will be mixed and fed to the furnace.

College of Pharmacy Observes Founders' Day

At the annual Founders' Day convocation of the Philadelphia College of Pharmacy and Science held February 19, two prominent pharmacists were honored and one of Philadelphia's leading educators was the principal speaker.

Crown Cork & Seal Reports Rise in Income

Crown Cork & Seal Co., in its 1958 Annual Report mailed to stockholders, reported that earnings from operations, after provisions for preferred dividends, climbed to $1.41 per common share from $.18 a share in the preceding year. 1958 net income after payment of preferred stock dividends totalled $1,499,000, an increase of $1,283,000 over the previous year's income of $216,000.

Lanolin Plus Announces Profits

Lanolin Plus, Inc., recently reported a profit for the six months ending Dec 31, 1958 of $664,806 before patent amortization and taxes on sales of $4,251,602. Morton Edell, president, announced that this compared with a loss of $231,385 before taxes and amortization for the previous six months ended June 30, 1958.

Norelco Schedules School in Chicago

The thirty-third session of the Norelco X-ray Diffraction and Spectrographic School for chemists, metallurgists, physicists, production supervisors, quality control engineers and others, will be held at the Edgewater Beach Hotel, Chicago, during the week of June 1-5. Registration for the week-long school will be limited to 125 for the first four days and to 150 on Friday.

Felton's Leon Gefen Ends U. S. Visit

Leon Gefen, manager of Felton Chemical Co.'s Versailles Factory, just returned to Paris after spending three weeks in Brooklyn at the head office. Mr. Gefen reports that conditions appear to have been stabilized considerably, and that all indications point to a record volume for the coming year.

Esperis S.A. suggests you write or telephone the American Lanolin Corporation, Lawrence, Mass. for a sample of "HYDROLAN," the remarkable new, and unique, hydrogenated lanolin and "ESPERISAL," crystalline sodium laurylsulfate, 100% active—recommended where odor and taste are of prime importance.

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United States Testing Co. Awarded QM Testing Contract

United States Testing Co., Inc., announced recently that it has been awarded a half-million dollar contract with the Quartermaster Corps of the U.S. Army, to test specification performance of Military suppliers on a wide variety of purchased products. The new contract became effective January 2 and is to continue for a one year peroid.

Society of Cosmetic Chemists Moves Library

Harry Isacoff, chairman of the Library Committee, has announced that the library of the Society of Cosmetic Chemists has been moved to The Chemists' Club, 52 East 41st St., New York 17, N.Y.

Crown Cork & Seal Building New Can Plant

Construction of an 80,000 square foot can plant was begun recently by Crown Cork & Seal Co., Inc., in Winchester, Va. Located on a 40-acre plot about a mile north of the community's boundary, the new plant will be equipped initially with two can manufacturing lines to supply containers to packers in the Winchester apple producing area. Plans for the plant provides for expansion to six lines when future demands for cans require it. The new plant, a moderate one-story masonry and brick structure, will have 650 feet of frontage on the Pennsylvania lines. Completion is scheduled for September.

BRECK ADDS RAMAC COMPUTER

At the Control Console of the new RAMAC Computer recently acquired by John H. Breck, Inc., are (left to right) Oscar Van Wyck, chief statistician; Betty Doherty, operator, Edward J. Breck, president of the firm; and Carl Weiland, IBM District Manager. The machine has been installed to expedite processing of customers orders.

Smith Kline & French May Split Stock

The Board of Directors of Smith Kline & French Laboratories recently recommended a three-for-one split in the company's common stock, subject to the approval of stockholders at their annual meeting May 21. The Directors also recommended that the shares be changed to no par value shares at that time.

Josten Co. Buys Elleni Cosmetic Line

The Josten Manufacturing Co. of Santa Barbara, California, is purchasing Elleni Cosmetics. The Elleni line of 21 products includes Luxury Bath, hand lotion and acne cream. A new sales organization will be set up for the products which are expected to eventually go into national distribution.

Experimental data and practical manufacturing experience of nearly 100 years' specialization in beeswax and beeswax compounds are at your service without cost or obligation. Write about your beeswax problems to **WILL & BAUMER CANDLE CO., INC., Syracuse, N. Y. Est. 1885** ***Dept. AP***

Spermaceti—Ceresine—Red Oil—Yellow Beeswax—Composition Waxes—Stearic Acid—Hydistear

British S.C.C. Holds Annual Dinner and Dance

Dr. and Mrs. R. H. Marriott

The Annual Dinner and Dance of the British Society of Cosmetic Chemists was held at the Cafe Royal on Feb. 6 and boasted a record attendance of over 200 members and guests. Dr. R. H. Marriott, president of the Society, preceded his toast to the guests by an account of the activities and difficulties of the Society during the past twelve months.

The principal guest of the evening was Frank Schon, to whose industry and leadership Dr. Marriott paid tribute.

Prominent among the guests were Mr. and Mrs. Gert Keller and Mr. van Ameringen.

Frank Schon, chairman of Marchon Products, commented that he had noticed in his travels that the sales of cosmetics in the United States per capita were twice those in Britain, yet he thought the beauty of the ladies to be about the same.

Luis de Hoyos Elected Mayor of Monticello

Luis de Hoyos

Luis de Hoyos, vice president and general manager of Synfleur Scientific Laboratories, was recently elected Mayor of the city of Monticello, N. Y. His father had served as Mayor of Monticello for 14 years until his death in 1951, and also as general manager of Synfleur.

Max Factor Declares Quarterly Dividend

The board of directors of Max Factor & Co. recently declared a quarterly dividend of 20 cents a share on the Class A stock and 10 cents a share on the Common stock, both payable March 31, 1959, to shareholders of record March 23.

Antara Chemicals Names New Distributor

Antara Chemicals, Sales Division of General Aniline & Film Corp., has named Amsco Solvents & Chemicals Co., Cincinnati, Ohio, as distributors for Igepal CO and CA surfactants. They will provide truck delivery of drum and bulk quantities in Cincinnati, Dayton, Columbus, Springfield and the Southern Ohio area. Drum stocks of all Igepal CO and CA surfactants are being warehoused in Cincinnati, permitting purchase of mixed truckloads of drums of Igepal and other products supplied by Amsco can make significant savings possible. Buyers may make their own bulk or drum pick-up or designate other carriers, if they wish.

Fleuroma Appoints New Perfumer

Francis Lions

Francis Lions recently arrived in the United States from France to join Fleuroma, Inc. as a perfumer. He is a native of Grasse, and is the son of Arthur Lions, who was very well known in the Perfume Industry. For 20 years, Mr. Lions was connected with two of the leading international Essential Oil and Perfume Compound companies and later served as a consultant to the French Perfume Industry.

Pfizer Annual Report Cites Advances in 110 Years

Chas. Pfizer & Co., Inc. looks back through 11 decades of sweeping scientific advance and sociological change in its 1958 Annual Report to share owners, entitled "Pfizer in Focus." The pharmaceutical in Focus." The pharmaceutical and chemical company is currently observing its 110th anniversary. World wide sales of $222.7 million in 1958 were the highest in the firm's history.

Penick Announces Chicago Changes

S. B. Penick & Co. has announced several revisions in connection with its Chicago operations designed to improve the company's service in the midwest area. The midwest sales activities of the NYQ Chemical Division will emanate from Chicago. W. E. Jennings and O. J. Hance, both long associated with the company, have been appointed full-time sales representatives of this division.

B-W LANOLIN U.S.P.

EVENTUALLY—For better creams, with economy

B-W Lanolin the superior quality puts into your cream that which gives the skin that smooth soft velvety feeling.

B-W Lanolin will never cause your cream to darken, is best by test and contains over 15% free and combined Cholesterol.

No other base used in your cream, equals the merits of B-W Lanolin.

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Executive Office, Laboratory and Factory: Linden, N.J.

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YARDLEY WINNERS OFF FOR LONDON

William Showaker, left, and Clarence Cooper, sales representatives for Yardley of London, Inc., are shown prior to their departure for London to represent the American firm at the English company's sales conference. Messrs. Showaker and Cooper were winners of the Yardley 1958 sales contest. The trip is their prize for top performances during the year.

Lentheric Launches Hawaiian Promotion

Lentheric has developed a "Vagabond Holiday to Hawaii" promotion which will break in a four-color, single gate-fold ad in the June issue of Holiday Magazine. The promotion combines the fashions of Jantzen, the fragrances of Lentheric, and the travel excitement of the Matson Steamship Lines. The Key store in the promotion will be Arnold Constables, New York.

Max Factor & Co. Ends Negotiations With Mutual

Max Factor & Co. announces that negotiations for the purchase of the Mutual Broadcasting System by Max Factor have been terminated. When the availability of Mutual became known to Max Factor, the company considered the possibility of utilizing the unsold time on the Mutual Broadcasting System for the promotion and sale of their products. It was felt, however, that the results would not justify the cost of the acquisition and on this basis the negotiations were terminated.

T.G.A. Issues Standard For 3,4,4'-Trichlorocarbanalide

The Board of Standards of the Toilet Goods Assn., Inc., has issued specification No. 76, a standard for 3,4,4'-Trichlorocarbanilide.

Arthur Punnar Marks 25 Years With Fritzsche Brothers

Fritzsche Brothers' fast growing Quarter-of-a-Century Club gained a new member on March 7 when Arthur Punnar, in charge of the firm's Printing Department, reached his 25th anniversary. Mr. Punnar's attainment of this goal was celebrated at a luncheon in his honor at Charles Restaurant where he was presented with a Government bond and embossed scroll by the firm's officers and directors. In addition to these, his fellow employees gave him a gold wristwatch appropriately inscribed.

Drug Items Use Bulk Of Collapsible Tube Output

Of the 1,004,947,000 collapsible tubes shipped by the industry in 1958, a total of 838,004,000, or 83% were used to package drug trade items, according to the anual statistical report of the Collapsible Tube Manufacturers' Council.

Tubes for dentifrices were 51% of total shipments for the year, as compared with 53% in 1957. This decline was reversed in the final weeks of the year, with December shipments up from 292,000 gross in 1957 to 337,000 gross, and from 49% to 53% of total shipments for the month.

The downtrend earlier in the year reflected the initial impact of plastic and aeosol containers for toothpaste, which was based, according to the Tube Manufacturers' Council, on novelty appeal and heavy introductory promotion.

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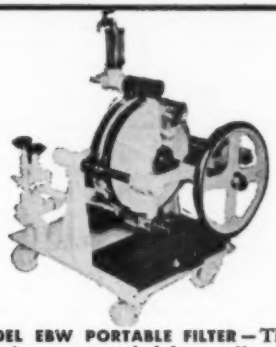
FILTERS AND BOTTLE FILLERS
for the Perfumer



MODEL EBW PORTABLE FILTER—This filter is recommended for small capacity requirements. Accomodates from 4 to 8 12¼" dia. filter disks. Easy to set-up and operate.

PORTABLE VACUUM BOTTLE FILLER

Will rapidly fill small or batch lots of material at lowest cost. Fills bottles to uniform height without loss of material. Interchangeable spouts for filling shaker-type bottles to gallons.

ASBESTOS FILTER SHEETS
Various Sizes

Ertel Asbestos Filter Sheets for ultra polished brilliance are used for many fine perfumes and cosmetics. Available in 10 grades to fit all standard filters. Write regarding samples for superior result tests in your filter.

Write for Illustrated Catalog

ERTEL ENGINEERING CORP.
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Branch Office & Showroom
New York City

NEW MENNEN CONTEST FLOOR STAND

The first section of the Mennen pre-pak floor stand display shipper to come off the presses is examined by Jack O'Reilly, head of Gibraltar Display Division's Creative Department. Looking on are, left to right: Michael Jackson, Assistant Ad Manager; Floyd Griffith, Buyer of Packaging Material and James Farrell, Specifications Manager—all of the Mennen Co. The stand will be used in the nationwide "Holiday Abroad Contest for Men" which the company will launch shortly.

Hooker Chemical Announces Three New Appointments

Maynard L. Parker has been appointed works manager, Nickerson Hinckley made production superintendent, heavy chemicals, and Raymond W. VerHoeve, production superintendent, fine chemicals, at the Niagara plant of the Eastern Chemical Division of Hooker Chemical Corp. Mr. Parker was formerly Niagara plant production superintendent, while Messrs. Hinckley and VerHoeve were assistant production superintendents there.

Penick Announces Realignment Of Divisional Responsibilities

Implementing its recently announced realignment of sales and service divisions, S. B. Penick & Co. has made the following appointments, effective immediately:

Barclay E. Mackinnon, formerly Vice President of the New York Quinine & Chemical Works, Inc., has been appointed Vice President of S. B. Penick & Co. in charge of the new NYQ Chemical Division.

Harold A. Meyer, Vice President, is now in charge of the Botanical & Allied Products Division, with **William W. Bell,** Vice President, as Assistant Manager in addition to his responsibilities for this Division's domestic products and all cultivation projects.

Frank Seeland, Vice President, continues as Manager of the newly named Farm Chemical & Insecticide Division, which has added antibiotic feed supplements to its line of products.

Rudy P. Neptun, formerly Vice President of the New York Quinine & Chemical Works, Inc., has been appointed Vice President of S. B. Penick & Co. with special responsibilities in sales development and promotion.

William A. Thawley, former Sales Manager of the New York Quinine & Chemical Works, Inc., has been appointed Director of Sales Coordination for the entire Penick organization. He has charge of all outside sales representatives as well as the coordination of the sales policies of the company's three marketing divisions.

James J. Verde, formerly Assistant Sales Manager of the New York Quinine & Chemical Works, Inc., has been appointed Sales Manager of the NYQ Chemical Division.

Now Available! Reprints of

"PRESERVATIVES and ANTIOXIDANTS"

The requests for the recent "Preservatives and Anti-Oxidants" series has been so great we are reprinting a limited number of copies of this documentary to meet the demand.

It is a comprehensive reference work on why and how deterioration manifests itself in off-odors . . . off-colors . . . discoloration . . . toxicity . . . and carries right on through the ways and means by which product preservation and stability can be improved.

Outstanding authorities in their fields bring you up to the minute on the uses, advantages and/or disadvantages of every important preservative and anti-oxidant: ethyl alcohol . . . propylene . . . glycol . . . glycerol . . . sorbic acid . . . combinations of the esters of para-hydroxybenzoic acid . . . the gallates . . . sterilization by electronic radiation.

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PERSONALITIES

Dr. Walter C. Meuly has been appointed director of research for Rhodia, Inc., according to a recent announcement

Dr. Walter C. Meuly

by the president, Raymond J. Picard. Dr. Meuly was formerly associated with E. I. DuPont de Nemours for 35 years. He is a graduate of the famous Polytechnic Institute of Zurich, and is considered a foremost authority in aromatic chemical research.

John S. Emish has been named Chicago branch sales representative for Kimble Glass Co., subsidiary of Owens-Illinois. He will handle sales of the firm's container and closure products.

Franklin H. Graf has been named executive vice president and a director of A. C. Nielsen Co., a marketing research

Franklin H. Graf

organization. He will direct all of Neilsen's United States Food-Drug operations, largest segment of the company's activities.

Claude L. Alexander has been appointed vice president and general manager of the Bradley-Sun Division of the American Can Co.

Lamson M. Scovill has been appointed Eastern District sales manager for the Scovill Manufacturing Co., and John H.

Lamson M. Scovill

John H. Gelwicks

Gelwicks has been named Western District sales manager. Mr. Scovill joined the company in 1932. He will be responsible for the territory east of Cleveland. Mr. Scovill, first vice president of CIBS, is also past chairman of the TGA Convention Committee and is a member of BIMS. Mr. Gelwicks joined the company in 1945 and will be responsible for the territory west of Cleveland. He is a member of the Chicago Perfumery, Soap and Extract Assn.

Philip Cortney, president of Coty, Inc., has been appointed Chairman of the Cosmetics Division of The Legal Aid Society's 1959 Campaign. Mr. Cortney is a Fellow of the New York Academy of Sciences, Chairman of the Dutch American Mercantile Corp. and a Director of the Societe Franco-Americaine de Banque of Paris. He is known as the author of an essay on "The Political and Economic Consequences of Lord Keynes Theories" and the book "The Economic Munich" as well as many articles in newspapers and periodicals.

Allan H. Kurtzman has been appointed assistant director of United States Merchandising for Max Factor & Co. He has

Allan H. Kurtzman

been assigned to the firm's home office in Hollywood and will assist in supervising the merchandising program for all Max Factor products. He has had ten years experience in the cosmetic field, spending most of that time in the New York area.

Samuel B. Prussin, director of new products and sales research of Aerosol Techniques, Inc., will speak on "Aerosol Pharmaceuticals" at the Canadian Pharmaceutical Assn. session, April 10, in Windsor, Ont.

Ralph E. Lamson has been named field sales manager of Bourjois, Inc., accord-

Ralph E. Lamson

ing to a recent announcement by G. A. O'Reilly, sales manager. He was previously with Prince Matchabelli-Seaforth.

Edward Ettinger has been elected vice president and director of the Schick Safety Razor Co. Mr. Ettinger will also be in charge of advertising for the company, a division of Eversharp, Inc.

John G. Scattergood has been appointed sales manager of the Marketing

John G. Scattergood

Division of the Reed Research Corp. He was previously associated with Powr-Pak.

William T. Keirnan, senior representative for Houbigant in the New England and New York State area, was doubly honored at a special dinner recently, by the presentation of a watch for twenty five years of service and also, on his retirement under the provisions of the Houbigant pension plan.

John P. McDonnell has been promoted to the position of assistant chief manufacturing chemist for John H. Breck, Inc. In his new position he will be responsible for the line supervision of the manufacturing department.

Carl K. Raiser, formerly director of distribution for the Smith, Kline & French Laboratories, has been named an assistant to the President, Walter Munns, and will represent Munns in certain industry and government acitivities. Raiser, who is also president of the National Pharmaceutical Council, will be succeeded as director of distribution by G. Frazier Chesten, who was previously in charge of SKF's hospital sales efforts.

Albert E. Ritchie has been appointed to the position of manager of the Wildroot Department within the Toilet Articles Division of Colgate-Palmolive Co. He will be responsible for the coordination of the overall marketing of Wildroot products. Mr. Ritchie began his career with the Wildroot Co. in Buffalo 28 years ago, in charge of syndicate store sales. He became Merchandising Manager in 1938 and Sales Manager in 1942. During 1954 he was elected to the position of Vice-President of Sales and last year became Vice-President of Marketing.

Gilbert W. Wiessner has been appointed sales representative for Crown Cork & Seal Co., for the state of North Carolina.

John F. Connelly, president of Crown Cork & Seal Co., Inc. has been named chairman of the Cardinal's Committee of the Laity for the Second Annual Catholic Charities Appeal throughout the ten-county Philadelphia Archdiocese.

Frank L. Stamberg has joined Prince Matchabelli Inc. as manager of Brand

Frank L. Stamberg

Operations including Polyderm Cosmetics, Siminetta Perfumes, and Black Watch Grooming Aids for Men, as well as New Products and Market Research. Mr. Stamberg was formerly Assistant to the President of Vick Chemical Co.

Arthur C. Gogarty has been elected president and treasurer of Tombarel Products Corp. of New York. Mr. Gogarty has been head of the Sales Division of the company for over eight years and has a wide and well-grounded knowledge of the essential oil and compound business. He was previously associated with Givaudan-Delawana, Inc. and S. B. Penick & Co.

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Book Reviews

THE SOFT DRINKS BOTTLER, Vol. II, by George B. Beattie. National Association of Soft Drinks Manufacturers, Ltd., London W. 1, England. 1958. 203 pages, size 8½ x 11, illustrated and indexed. Price 30 shillings.

This second of two volumes opens with Chapter 21, the bottle and the bottle cleaning department. Six chapters of some 80 pages discuss all phases of bottle preparation and closure. Several more chapters deal with cases and similar devices. About 16 pages deal with the manufacture of cordials, squashes and similar carbonated and still beverages. Plant layout and operation complete the book.

The book may seem elementary, but it is intended for the beginner. To this group, it will be a valuable reference if not a text.—M. G. deN.

ENCYCLOPEDIA OF CHEMICAL REACTIONS, compiled by C. A. Jacobsen, edited by C. A. Hempel. Reinhold Publishing Corp., New York 22, N. Y. 1958. 479 pages, size 6½ x 9¼ inches, indexed. Price $12.75.

This seventh volume in the series covers reactions of Sr, S, Ta, Tc, Te, Tb, Tl, Tm, Th, Sn and Ti, along with some 400 references. There is a total of over 1,700 entries. None of the reactions have been tested.

Coverage is best in earlier years although there are some items as late as 1957. This reviewer realizes the difficulties in keeping material of this type "right up to date," but an opportunity for updating will come along in later revisions.—M. G. deN.

CHEMICAL FORMULARY, CUMULATIVE INDEX FOR VOLUMES I TO X, by H. Bennett. Chemical Publishing Co., Inc., New York 10, N. Y. 1958. 497 pages, size 9 x 5¾ inches. Price $12.00.

This cumulative index consists of over 25,000 entries found in the ten volumes of this work. It will be found useful by all who own the complete set, saving much time in the search for data. The author is to be congratulated for making this effort.—M. G. deN.

CHEMISTRY AND TECHNOLOGY OF LEATHER, Vol. II, by Fred O'Flaherty, William T. Roddy and Robert M. Lollar. A. C. S. Monography 134, Reinhold Publishing Corp., New York 22, N. Y. 1958. 554 pages, size 9¼ x 6 inches, indexed and illustrated. Price $16.50.

Part of a four volume monograph, this volume discusses chemistry, processing and mechanism of tannery.

The ionization and complex formation of aluminum salts is well described although Theis' earlier volume goes into greater detail.

All types of usual and uncommon tannage are discussed although certain types are covered in greater detail due to wider usage.

The book is well done and a worthy companion to Volume I.—M. G. deN.

SYNTHETISCH WASCH- UND REINIGUNGSMITTEL, by Helmuth Stupel. Konradin Verlag Robert Kohlhammer, Stuttgart, Germany. 568 pages, size 9¼ x 6 inches, indexed and illustrated. Price 68 DM.

Eight main sections cover the chemistry, manufacture and use of synthetic detergents. Trade names, chemical composition, per cent active material and manufacturers' names are given under each main type.

Included is some excellent material on complex phosphates and organic sequesterants.

Though a little more than half the size of Lindner's excellent work, the present volume, one of two, is a valuable companion.

Many facets of detergency of diverse surfaces are discussed. Bactericidal properties, industrial formulations, theoretical considerations in compounding and use, methods of analysis are among the many subjects discussed, all in German.—M. G. deN.

A DICTIONARY OF SCIENTIFIC TERMS, 6th Edition, by I. F. and W. D. Henderson and J. H. Kenneth. D. Van Nostrand Co., Inc., Princeton, N. J. 1957. 532 pages, size 9 x 5½ inches. Price $12.50.

In these days of overlapping and intermixing scientific disciplines, there is a need for a good dictionary of terms used in these fields. Similarly, it is important to have a pronunciation for these words. The present volume has done this well for eight different subjects (biology, botany, zoology, anatomy, cytology, genetics, embryology and physiology), not including chemistry or physics. Though usage is British, due recognition of American orthography is given.

The value of a dictionary is the number and quality of listings. The present volume fulfills these requirements.—M. G. deN.

MANUAL OF PHARMACEUTICAL LAW by William Pettit. The Macmillan Co., New York, N. Y. 1957. 393 pages, size 5½ x 8 inches, indexed.

This is a compendium of various laws affecting pharmacy and the pharmacist, both State and Federal. Regulations promulgated under these laws together with court cases comprise this text which is used in the teaching of pharmaceutical jurisprudence—M. G. deN.

THE PHARMACY OF THE SILICONES, by Ronald Levin. The Chemist and Druggist, London W. C. 2, England. 1958. 95 pages, size 8½ x 4¾ inches. Price 15 shillings.

Though the book is addressed to clinical workers in pharmacy, it is truly a panorama of the organosilicon compounds as they pertain to the practice of pharmacy and related fields.

The book is divided into eight chapters which include chemistry, properties, toxicology, medical and related applications, pharmacy, cosmeticology and analysis.

This is a worthwhile reference where nothing too complicated is desired.—M. G. deN.

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